CHAPTER 3

ENVIRONMENTAL SETTING

Introduction
Air Quality
Energy
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3.0 ENVIRONMENTAL SETTING

3.1 INTRODUCTION

CEQA Guidelines §15125 requires that an EIR include a description of the environment within the vicinity of a proposed project as it exists at the time the NOP/IS is published, or if no NOP/IS is published, at the time the environmental analyses commences, from both a local and regional perspective. This chapter presents the existing environmental setting for the proposed project against which potential impacts of the project have been evaluated. This chapter also describes the existing environment around the El Segundo Refinery as applicable that could be adversely affected by the proposed project. This EIR is focused only on the environmental topics identified in the NOP/IS (see Appendix A) that could be significantly adversely affected by the proposed project. The reader is referred to the NOP/IS for discussion of environmental topics not considered in this EIR, and the rationale for inclusion or exclusion of each environmental topic. The environmental topics identified in this chapter include both a regional and local setting.

3.2 AIR QUALITY

The Chevron Products Company El Segundo Refinery is located within the SCAQMD jurisdiction (referred to hereafter as the district). The district consists of the four-county Basin that includes Orange, and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties, the Riverside County portions of the Salton Sea Air Basin (SSAB), and the Mojave Desert Air Basin (MDAB). The Basin is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east.

3.2.1 METEOROLOGICAL CONDITIONS

The climate in the Basin generally is characterized by sparse winter rainfall and hot summers tempered by cool ocean breezes. A temperature inversion, a warm layer of air that traps the cool marine air layer underneath it and prevents vertical mixing, is the prime factor that allows contaminants to accumulate in the Basin. The mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds. The climate of the area is not unique, but the high concentration of mobile and stationary sources of air contaminants in the western portion of the Basin, in addition to the mountains, which surround the perimeter of the Basin, contribute to poor air quality in the region.

3.2.2 TEMPERATURE AND RAINFALL

Temperature affects the air quality of the region in several ways. Local winds are the result of temperature differences between the relatively stable ocean air and the uneven heating and cooling that takes place in the Basin due to a wide variation in topography. Temperature also has a major effect on vertical mixing height and affects chemical and photochemical reaction times. The annual average temperatures vary little throughout the Basin, averaging 75^{o}F. The coastal areas show little variation in temperature on a year round basis due to the moderating effect of the marine influence. On average, August is the warmest month while January is the coolest month. Most of the annual rainfall in the Basin falls between November and April. Annual average rainfall varies from nine inches in Riverside to 14 inches in downtown Los Angeles.

3.2.3 WIND FLOW PATTERNS

Wind flow patterns play an important role in the transport of air pollutants in the Basin. The winds flow from offshore and blow eastward during the daytime hours. In summer, the sea breeze starts in mid-morning, peaks at 10-15 miles per hour, and subsides after sundown. There is a calm period until about midnight. At that time, the land breeze begins from the northwest, typically becoming calm again about sunrise. In winter, the same general wind flow patterns exist except that summer wind speeds average slightly higher than winter wind speeds. This pattern of low wind speeds is a major factor that allows the pollutants to accumulate in the Basin.

The normal wind patterns in the Basin are interrupted by the unstable air accompanying the passing storms during the winter and infrequent strong northeasterly Santa Ana wind flows from the mountains and deserts north of the Basin.

3.2.4 EXISTING AIR QUALITY

Local air quality in the Basin is monitored by the SCAQMD, which operates a network of monitoring stations throughout the Basin. CARB operates additional monitoring stations.

3.2.4.1 Criteria Pollutants

The sources of air contaminants in the Basin vary by pollutant but generally include on-road mobile sources (e.g., automobiles, trucks and buses), other off-road mobile sources (e.g., airplanes, ships, trains, construction equipment, etc.), residential/commercial sources, and industrial/manufacturing sources. Mobile sources are responsible for a large portion of the total Basin emissions of several pollutants.

Mobile sources, both on-road and off-road, continue to be the major contributors for each of the five criteria pollutants monitored in the Basin. For example, mobile sources represent 64 percent of VOC emissions, 91 percent of NOx emissions, and 98 percent of CO emissions. For directly emitted particulate matter less than 2.5 microns in diameter (PM2.5), mobile sources represent 39 percent of the emissions with another 20 percent due to vehicle-related entrained road dust (SCAQMD, 2007).

Criteria air pollutants are those pollutants for which the federal and state governments have established ambient air quality standards or criteria for outdoor concentrations in order to protect public health with a margin of safety (see Table 3-1). National Ambient Air Quality Standards (NAAQS) were first authorized by the federal Clean Air Act of 1970 and have been set by the U.S. EPA. California Ambient Air Quality Standards were authorized by the state legislature in 1967 and have been set by CARB. Air quality of a region is considered to be in attainment of the standards if the measured concentrations of air pollutants are continuously equal to or less than the air quality standards over the previous three-year period.

Health-based air quality standards have been established by the U.S. EPA and the CARB for ozone, CO, NOx, PM10, PM2.5, SOx, and lead. The California standards are more stringent than the federal air quality standards. California also has established standards for sulfate, visibility, H_2S,

TABLE 3-1

Federal and State Ambient Air Quality Standards

	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
AIR POLLUTANT	CONCENTRATION/ AVERAGING TIME	CONCENTRATION/ AVERAGING TIME	
Ozone	0.09 ppm, 1-hr. avg. > 0.07 ppm, 8-hr	0.08 ppm, 8-hr avg>	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.>	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 µg/m^3, ann. arithmetic mean > 50 µg/m^3, 24-hr average>	Annual standard revoked in 2006 arithmetic mean > 150 µg/m^3, 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 µg/m^3, ann. Arithmetic mean	15 µg/m^3, annual arithmetic mean> 35 µg/m^3, 24-hour average>(1)	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	1 µg/m^3, 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m^3, 30-day avg. >=	1.5 µg/m^3, calendar quarter>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)		Visibility impairment on days when relative humidity is less than 70 percent

(1) The U.S. EPA lowered the PM2.5 24-hour average standard from 65 ug/m^3 to 35 ug/m^3 in September 2006.

Note: ppm = parts per million
µg/m^3 = micrograms per cubic meter

and vinyl chloride. H_2S and vinyl chloride currently are not monitored in the Basin because they are not a regional air quality problem, but are generally associated with localized emission sources. The Basin is currently designated as non-attainment for PM10, PM2.5, and ozone for both state and federal standards. The Basin, including the project area, is classified as attainment for both the state and federal standards for CO, NOx, SOx, sulfates, and lead.

3.2.4.2 Regional Air Quality

The SCAQMD monitors levels of various criteria pollutants at approximately 30 monitoring stations. In 2006, the maximum ozone, PM10 and PM2.5 concentrations continued to exceed federal standards by wide margins. Maximum one-hour and eight-hour average ozone concentrations (0.180 parts per million (ppm) and 0.142 ppm, recorded in the east San Gabriel Valley and central San Bernardino Mountain areas, respectively) were 150 and 178 percent of the federal standard. The central San Bernardino Mountain area has remained as the most affected area in terms of the number of days exceeding the eight-hour federal ozone standard in recent years (SCAQMD, 2006), with 59 days in 2006, followed by the Perris Valley with 53 days in 2006 (SCAQMD, 2006). Other areas that exceeded the state ozone standards included the San Gabriel Valley, San Fernando Valley, San Bernardino and Riverside counties including the Coachella Valley (SCAQMD, 2006).

Maximum 24-hour average and annual average PM10 concentrations (142 micrograms per cubic meter (ug/m^3)) recorded in the Central San Bernardino Valley area and 125 ug/m^3 recorded in the Perris Valley area in the Riverside County area) were 94 and 83 percent of the federal 24-hour and annual average standards, respectively. Maximum 24-hour average and annual average PM2.5 concentrations (72.2 ug/m^3 recorded in south San Gabriel Valley area and 68.5 ug/m^3 recorded in Metropolitan Riverside County area) were 206 and 196 percent of the federal 24-hour and annual average standards, respectively (SCAQMD, 2006).

The CO concentrations did not exceed the standards in 2006. The highest eight-hour average CO concentration recorded (6.4 ppm in south central Los Angeles County area) was ten percent of the federal CO standard. The maximum annual average NO_2 concentration (0.0310 ppm recorded in the northwest San Bernardino Valley area) was 58 percent of the federal standard. Concentrations of other pollutants remained well below the federal standards (SCAQMD, 2006).

In 2006, neither federal nor state standards for NO_2, SO_2 or lead were exceeded. Currently, the District is in attainment with the ambient air quality standards for CO, lead, SO_2, and NO_2. In 2006, the sulfate standard was exceeded in the San Gabriel valley on one day, or on 1.7 percent of the days sampled (SCAQMD, 2006).

3.2.4.3 Local Air Quality

The project site is located within the SCAQMD's Southwest Coastal Los Angeles County 2 source receptor area. Recent background air quality data for criteria pollutants for the Southwest Coastal Los Angeles County 2 monitoring station are presented in Table 3-2. The area has shown a general improvement in air quality with decreasing or consistent concentrations of most pollutants (see Table 3-2). Air quality in the Southwest Coastal Los Angeles County 2 source receptor area complies with the state and federal ambient air quality standards for CO, NO_2, SO_2 and lead. The

TABLE 3-2

Ambient Air Quality Southwest Coastal Los Angeles County 2 Monitoring Station (2002-2006) Maximum Observed Concentrations

CONSTITUENT		2002	2003	2004	2005	2006
Ozone:	1-Hour (ppm)	0.088	0.110	0.120*	0.086	0.08
	Federal Standard	(0)	(0)	(0*)	(0)	(0)
	State Standard	(0)	(2)	(4*)	(0)	(0)
	8-Hour (ppm)	0.073	0.078	0.100*	0.076	0.066
	Federal Standard	(0)	(0)	(4*)	(0)	(0)
	State Standard	(--)	(--)	(13*)	(1)	(0)
Carbon Monoxide:						
	1-Hour (ppm)	7	7	6*	3	3
	8-Hour (ppm)	6.1	5.0	4.4*	2.1	2.3
	Federal Standard	(0)	(0)	(0*)	(0)	(0)
	State Standard	(0)	(0)	(0*)	(0)	(0)
Nitrogen Dioxide:						
	1-Hour (ppm)	0.10*	0.12	0.09*	0.09	0.02
	State Standard	(0)	(--)	(--)	(--)	(--)
	24-Hour (ppm)	--	--	--	--	0.006
	Annual (ppm)	0.0244*	0.0238	0.0136*	0.0134	0.0020
PM10:	24-Hour (ug/m^3)	121	58	47*	44	45
	Federal Standard	(0)	(0)	(0*)	(0)	(0)
	State Standard	(19.7%)	(4.9%)	(0.0*%)	(0.0%)	(0.0%)
	Annual (ug/m^3)					
	Geometric Mean	34.1	(--)	(--)	(--)	(--)
	Arithmetic Mean	37.4	29.7	25.1*	22.9	26.5
PM2.5:	24-Hour (ug/m^3)	--	--	--	--	--
	Federal Standard	(--)	(--)	(--)	(--)	(--)
	Annual Arithmetic Mean (ug/m^3)	--	--	--	--	--
Sulfur Dioxide:						
	1-Hour (ppm)	0.07	0.03	0.02*	0.04	0.02
	24-Hour (ppm)	0.007	0.006	0.007*	0.012	0.006
	Annual Arithmetic Mean (ppm)	--	--	--	--	0.0020
Lead:	30-Day (ug/m^3)	0.02	0.17	0.01	--	0.01
	Quarter (ug/m^3)	0.02	0.10	0.01	--	0.01
Sulfate:	24-Hour (ug/m^3)	15.6	16.4	14.3	--	13.6
	State Standard	(0%)	(0%)	(0%)	(--)	(0%)

Source: SCAQMD Air Quality Data Annual Summaries 2002-2006.

Notes: (18) = Number of days or percent of samples exceeding the state standard, (--) = Not monitored, ppm = parts per million, ug/m^3 = micrograms per cubic meter, * = Less than 12 full months of data, so data may not be representative.

air quality in the area also is in compliance with the federal eight-hour ozone standard and the federal and state 24-hour PM10 standard.

The monitoring station in the Southwest Coastal Los Angeles County 2 area source receptor did not monitor PM2.5 levels in 2006. The nearest monitoring station to the

proposed project that did monitor PM2.5 levels in 2006 is the South Coastal Los Angeles County station. The air quality in the South Coastal Los Angeles County source receptor area exceeded the federal 24-hour PM2.5 standards on 1.7 percent of the days sampled. The air quality in this monitoring area also exceeds PM2.5 state annual average standards (SCAQMD, 2006).

3.2.4.4 Chevron Products Company El Segundo Refinery Criteria Pollutant Emissions

Operation of the existing Chevron Products Company El Segundo Refinery results in the emissions of criteria pollutants. The reported emissions of criteria air pollutants from the Refinery for the last five-year period, based on the annual emission fee reports prepared for the SCAQMD, are shown in Table 3-3. The emissions in Table 3-3 are based on actual operations and not the maximum potential to emit (PTE). Baseline for the Refinery is considered to be the actual emissions for the facility, unless the units have reached their PTE, in which case PTE is considered to be the baseline, e.g., the ISOMAX heaters have reached their PTE during recent Refinery operations so that the baseline is the PTE. The Chevron Products Company El Segundo Refinery is permitted for higher emissions than presented in Table 3-3.

TABLE 3-3

Chevron El Segundo Refinery
Reported Criteria Pollutant Emissions (Tons/Year)

Reporting Period	CO	VOC	NOx	SOx	PM10
2002-2003	3,104	825	1,023	1,179	272
2003-2004	3,222	1,011	1,036	1,288	420
2004-2005	2,068	775	1,088	1,142	427
2005-2006	892	631	1,007	396	357
2006-2007	765	588	902	388	318

The baseline for the Refinery was determined using five years of actual operational data because of the cyclical nature of the refining processes. Five years provides a reasonable period of time to take into consideration the variability of the refining operations, e.g., unit shutdowns for maintenance or repair, equipment replacement/repair, equipment failures, etc. In addition, the five-year baseline takes into consideration catalyst behavior which is generally more efficient during the earlier periods of use (catalysts generally require replacement every three to five years).

3.2.4.5 Toxic Air Contaminants

The California Health and Safety Code (§39655) defines a TAC as an air pollutant which may cause or contribute to an increase in mortality, an increase in serious illness, or which may pose a present or potential hazard to human health. Under California's TAC program

(Assembly Bill 1807, Health and Safety Code §39650 et seq.), the CARB, with the participation of the local air pollution control districts, evaluates and develops any needed control measures for air toxics. The general goal of regulatory agencies is to limit exposure to TACs to the maximum extent feasible.

Monitoring for TACs is limited compared to monitoring for criteria pollutants because toxic pollutant impacts are typically more localized than criteria pollutant impacts. CARB conducts air monitoring for a number of TACs every 12 days at approximately 20 sites throughout California. The Refinery is located closest to the North Long Beach Monitoring station. A summary of the averaged data from 2006 monitoring from the North Long Beach station for various TACs is considered to be an appropriate estimate of the TAC concentration in the vicinity of the Refinery (see Table 3-4).

The SCAQMD measured TAC concentrations as part of its Multiple Air Toxic Exposure Study, referred to as MATES. The purpose of the study is to provide an estimate of exposure to TACs to individuals within the Basin. In the second study, MATES-II, the SCAQMD conducted air sampling at about 24 different sites for over 30 different TACs between April 1998 and March 1999. The Final MATES-II Report from this study indicated the following: (1) cancer risk levels appear to be decreasing since 1990 by about 44 percent to 63 percent; (2) mobile source components dominate the risk; (3) approximately 70 percent of all risk is attributed to diesel particulate emissions; (4) about 20 percent of all risk is attributed to other toxics associated with mobile sources; (5) about 10 percent of all risk is attributed to stationary sources; and (6) no local "hot spots" have been identified. The average carcinogenic risk in the Basin is about 1,400 per million people. This means that 1,400 people out of a million are susceptible to contracting cancer from exposure to the known TACs over a 70-year period of time. The cumulative risk averaged over the four counties (Los Angeles, Orange, Riverside and San Bernardino) 980 in one million when diesel sources are included and about 260 in one million when diesel sources are excluded. Of the monitoring sites in the MATES-II study, the Hawthorne microscale study site is the closest to the Chevron Refinery. The Hawthorne site identified no specific stationary sources of toxic emissions within the prescribed monitoring area. The results of the monitoring for the Hawthorne site indicate that regional emissions (e.g., mobile sources) overwhelm local influences (local stationary sources). The complete final Report on the MATES-II study is available from the SCAQMD (SCAQMD, 2000).

The SCAQMD recently concluded a third study, referred to as MATES-III, that includes monitoring for 21 TACs at ten fixed, and five temporary, sites within the Basin in neighborhoods near toxic emission sources or in areas where community members are concerned about health risks from air pollution. The initial scope of the monitoring was for a one-year period from April 2004 through March 2005. Due to heavy rains in the Basin in the fall and winter of this period, there was concern that the measurements may not be reflective of typical meteorology. The study was thus extended for a second year from April 2005 through March 2006. The SCAQMD has released a Draft Report from this study, which is out for public review and comment period until April 4, 2008. The MATES-III found about 94 percent of the risk is attributed to emissions associated with

TABLE 3-4

Ambient Air Quality Toxic Air Contaminants – North Long Beach Maximum Concentration 2006

Pollutant	Annual average	Pollutant	Annual average
VOCs	**ppbv[1]**		**ppbv**
Acetaldehyde	3.8	Ethyl Benzene	0.7
Acetone	33	Formaldehyde	7.3
Acetonitrile	5.5	Methyl Bromide	0.08
Acrolein	1.3	Methyl Chloroform	0.23
Acrylonitrile	0.8	Methyl Ethyl Ketone	0.3
Benzene	1.8	Methyl tertiary - Butyl Ether	--
1,3 – Butadiene	0.57	Methylene Chloride	1.1
Carbon Disulfide	0.05	Perchloroethylene	0.28
Carbon Tetrachloride	--	Styrene	0.9
Chloroform	0.13	Toluene	15
o – Dichlorobenzene	0.15	Trichloroethylene	0.09
p – Dichlorobenzene	0.15	meta/para – Xylene	2.7
cis – 1,3 – Dichloropropene	0.05	Ortho – Xylene	1.0
trans – 1,3 – Dichloropropene	0.05		
PAHs[2]	**nanograms/m^3[3]**		**Nanograms/m^3**
Benzo(a)pyrene	0.61	Benzo(k)fluoranthene	0.019
Benzo(b)fluoranthene	0.51	Dibenz(a,h)anthracene	0.18
Benzo(g,h,i)perylene	1.7	Indeno(1,2,3-cd)pyrene	0.64
Inorganic compounds[4]	**nanograms/m^3**		**nanograms/m^3**
Aluminum	1700	Nickel	9
Antimony	3	Phosphorous	35
Barium	56	Potassium	890
Bromine	9	Rubidium	4
Calcium	2300	Selenium	1
Chlorine	2000	Silicon	5600
Chromium	6	Strontium	24
Cobalt	7.5	Sulfur	1300
Copper	36	Tin	2.5
Hexavalent Chromium [5]	0.11	Titanium	140
Iron	1600	Uranium	1.5
Lead	12	Vanadium	23
Manganese	33	Yttrium	2
Mercury	1.5	Zinc	110
Molybdenum	1	Zirconium	7

Source: CARB, 2006. Annual Toxics Summary by Monitoring Sites.

(1) ppbv = parts per billion by volume.

(2) The most recent data for PAHs is for 2004.

(3) nanograms/m^3 = nanograms per cubic meter.

(4) The most recent data for inorganic compounds is from 2003.

(5) 2006 data.

mobile sources, and about six percent of the risk is attributed to toxics emitted from stationary sources, which include industries, and businesses such as dry cleaners and chrome plating operations. The results indicate that diesel exhaust is the major contributor to air toxics risk, accounting for about 84 percent of the total. Compared to previous studies of air toxics in the Basin, this study found a decreasing risk for air toxics exposure, with the population weighted risk down by 17 percent from the analysis in MATES-II. The highest risks are found near the port area, an area near central Los Angeles, and near transportation corridors. The average carcinogenic risk in the Basin is about 1,200 per million people. This means that 1,200 people out of a million are susceptible to contracting cancer from exposure to the known TACs over a 70-year period of time. Of the monitoring sites in the MATES-III study, the North Long Beach study site is the closest to the Chevron Refinery. The results of the monitoring for the North Long Beach site indicate that regional emissions (e.g., mobile sources) overwhelm local influences (local stationary sources). The complete Draft Report on the MATES-III study is available online and can be accessed from the SCAQMD websie at http://www.aqmd.gov/prdas/matesIII/matesIII.html. Once the MATES-III study results are finalized and adopted by the SCAQMD Governing Board, they will supercede the MATES-II study results.

3.2.4.6 Greenhouse Gases

Global warming is the observed increase in average temperature of the earth's surface and atmosphere. An identified contributor to global warming is an increase of GHGs in the atmosphere. Due to the global nature of the effects of greenhouse gases, the environmental setting, and applicable impacts are primarily discussed in Chapter 5 – Cumulative Impacts.

3.2.5 REGULATORY BACKGROUND

Ambient air quality standards in California are the responsibility of, and have been established by, both the U.S. EPA and CARB. These standards have been set at concentrations, which provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 3-1. The SCAQMD has established levels of episodic criteria and has indicated measures that must be initiated to immediately reduce contaminant emissions when these levels are reached or exceeded. The federal, state, and local air quality regulations are identified below in further detail.

3.2.5.1 Federal Regulations

The U.S. EPA is responsible for setting and enforcing the NAAQS for ozone, CO, NO_2, SO_2, PM10, PM2.5, and lead. The U.S. EPA has primary jurisdiction over emissions sources that are under the primary authority of the federal government including aircraft, locomotives, and emissions sources (marine vessels) outside state waters (Outer Continental Shelf). However, SCAQMD rules apply to stationary sources in the Outer Continental Shelf as authorized in the Clean Air Act. The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

In 1990, the amendments to the federal CAA conditionally required states to implement programs in federal CO non-attainment areas to require gasoline to contain a minimum oxygen content in the winter beginning in November 1992. In response to the federal CAA requirements to reduce CO emissions, California established a wintertime oxygenate gasoline program requiring between 1.8 and 2.2 weight percent oxygen content in gasoline.

Other federal regulations applicable to the proposed project include Title III of the Clean Air Act, which regulates TACs. Title V of the Act establishes a federal permit program. The Refinery has submitted its Title V permit application and the proposed project will require modifications to the Title V application and/or operating permit. The Title V program is implemented by the SCAQMD in the southern California area. The U.S. EPA also has authority over the PSD Program with some authority delegated to the SCAQMD and a PSD review may be required for the proposed project because the proposed Refinery modifications will result in an increase in NOx and SOx emissions.

3.2.5.2 California Regulations

CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. CARB has established California Ambient Air Quality Standards for all pollutants for which the federal government has NAAQS and also has standards for sulfates, visibility, H_2S and vinyl chloride. H_2S and vinyl chloride are not measured at any monitoring stations in the Basin because they are not considered to be a regional air quality problem. California standards are generally more stringent than the NAAQS. CARB has established emission standards for vehicles sold in California and for various types of equipment. CARB also sets fuel specifications to reduce vehicular emissions, although it has no direct regulatory approval authority over the proposed project. Federal and state air quality standards are presented in Table 3-1.

California gasoline specifications are governed by both state and federal agencies. During the past decade, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB adopted the Reformulated Gasoline Phase III regulations that required, among other things, that California phase out the use of MTBE in gasoline.

The California Clean Air Act (AB2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

California also has established a state air toxics program (AB1807, Tanner) which was revised by the new Tanner Bill (AB2728). This program sets forth provisions to implement the national program for control of hazardous air pollutants.

The Air Toxic "Hot Spots" Information and Assessment Act (AB2588), as amended by Senate Bill 1731 (SB1731), requires operators of certain stationary sources to inventory air toxic emissions from their operations and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be "significant" (cancer risk greater than 10 per million exposures or non-cancer hazard index greater than 1.0), each facility operator must, upon approval of the health risk assessment, provide public notification to affected individuals.

3.2.5.3 Local Regulations

The Basin is under the jurisdiction of the SCAQMD, which has regulatory authority over stationary sources, air pollution control equipment, and limited authority over mobile sources. The SCAQMD is responsible for air quality planning in the Basin and development of the Air Quality Management Plan (AQMP). The AQMP establishes the strategies that will be used to achieve compliance with National and California Ambient Air Quality Standards in all areas within the SCAQMD's jurisdiction. The SCAQMD generally regulates stationary sources of air pollutants. There are a number of SCAQMD regulations that may apply to the proposed project including Regulation II – Permits, Regulation III – Fees, Regulation IV – Prohibitions, Regulation IX – New Source Performance Standards, Regulation X - National Emissions Standards for Hazardous Air Pollutants (NESHAPS) Regulations, Regulation XI – Source Specific Standards, Regulation XIII – New Source Review, Regulation XIV – Toxics and Other Non-criteria Pollutants (including Rule 1401 - New Source Review of Toxic Air Contaminants, and Rule 1403 - Asbestos Emissions from Demolition/Renovation Activities), Regulation XVII – Prevention of Significant Deterioration, Regulation XX – Regional Clean Air Incentives Market (RECLAIM) Program, and Regulation XXX – Title V Permits.

3.3 ENERGY

3.3.1 STATEWIDE ENERGY TRENDS

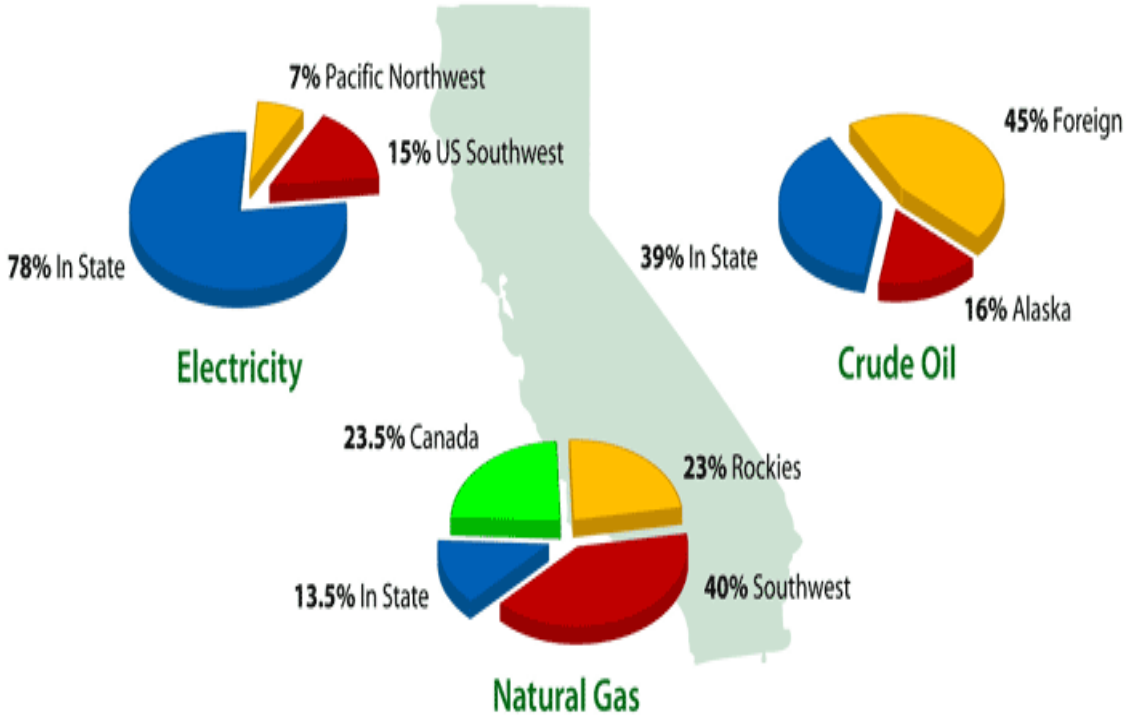
Figure 3-1 shows California's major sources of energy. In 2006, 39 percent of the crude oil came from in-state, with 16 percent coming from Alaska, and 45 percent being supplied by foreign sources. Also in 2006, 78 percent of the electricity came from in-state sources, while 22 percent was imported into the state. The electricity imported totaled 64,763 gigawatt hours (gWh), with 19,804 gWh coming from the Pacific Northwest and 44,959 gWh from the Southwest (CEC, 2007b). (Note: A gigawatt is equal to one million kilowatts). For natural gas in 2006, 40 percent came from the Southwest, 23 percent from Canada, 14 percent from in-state, and 23 percent from the Rockies (CEC, 2007a).

3.3.1.1 Electricity

Power plants in California provided approximately 78 percent of the in-state electricity demand in 2006. Hydroelectric power from the Pacific Northwest provides another 7

percent, and power plants in the Southwestern U.S. provide another 15 percent. The relative contribution of in-state and out-of-state power plants depends upon, among other factors, the precipitation that occurred in the previous year and the corresponding amount of hydroelectric power that is available. Two of the largest power plants in California are located in southern California: Alamitos and Redondo Beach. Both of these plants consume natural gas to produce electricity. San Onofre, the state's largest power plant in terms of net capability, is nuclear powered and is located in San Diego County. In addition in Southern California, a significant percentage of our imported power comes from plants that are generally coal-fired facilities.

FIGURE 3-1
California's Major Sources of Energy (2006)



Local electricity distribution service is provided to customers within southern California by one of two privately owned utilities – either SCE or San Diego-based Sempra Energy – or by a publicly-owned utility, such as the Los Angeles Department of Water and Power.

SCE is the largest electricity utility in southern California with a service area that covers all or nearly all of Orange, San Bernardino, and Ventura counties, and most of Los Angeles and Riverside counties. SCE provides approximately 70 percent of the total electricity demand in southern California.

The Los Angeles Department of Water and Power is the largest of the publicly owned electric utilities in southern California. Los Angeles Department of Water and Power

provides electricity service to most customers located in the City of Los Angeles and provides approximately 20 percent of the total electricity demand in the Basin.

Table 3-5 shows the amount of electricity delivered to residential and nonresidential entities in Los Angeles County in 2005 (CEC, 2007).

TABLE 3-5

California Utility Electricity Deliveries for 2005

	Residential		Non-residential		Total	
County	**Number of Accounts**	**kWh[1] (million)**	**Number of Accounts**	**kWh (million)**	**Number of Accounts**	**kWh (million)**
Los Angeles	3,071,899	19,796	358,286	49,380	3,430,185	69,177

California Energy Commission (CEC, 2007)

[1] kilowatt-hour (kWh): The most commonly-used unit of measure telling the amount of electricity consumed over time. It means one kilowatt (1000 watts) of electricity supplied for one hour.

The Chevron Refinery currently operates three existing Cogeneration Units generating power and high pressure steam to operate refinery equipment. Electricity supply at the Refinery is supplemented by SCE, providing approximately 20 MW.

3.3.1.2 Liquid Petroleum Fuels

California is currently ranked fourth in the nation among oil producing states, behind Louisiana, Texas, and Alaska, respectively. Crude oil production in California averaged 731,150 BPD in 2004, a decline of 4.7 percent from 2003. Statewide oil production has declined to levels not seen since 1943. In 2005, the total receipts to refineries of roughly 674 million barrels came from in-state oil production (39.4 percent), combined with oil from Alaska (20.1 percent), and foreign sources (40.4 percent) (CEC, 2006b).

California is the major refining center for West Coast petroleum markets with combined crude oil distillation capacity totaling more than 1.9 million BPD, ranking the state third highest in the nation. California ranks first in the U.S. in gasoline consumption and second in jet fuel consumption (CEC, 2006).

A large network of crude oil pipelines connect producing areas with refineries that are located in the San Francisco Bay area, Los Angeles area and the Central Valley. Major ports in northern and southern California receive Alaska North Slope and foreign crude oil for processing in many of the state's 21 refineries (CEC, 2006b).

Most gasoline and diesel fuel sold in California for on-road motor vehicles is refined in California to meet state-specific formulations required by CARB. Major petroleum refineries in California are concentrated in three counties: Contra Costa County in northern

California, Kern County in central California, and Los Angeles County in southern California. In Los Angeles County, petroleum refineries are located mostly in the southern portion of the county (SCAG, 2005).

Californians use nearly 44 million gallons of gasoline and 10 million gallons of diesel every day. California refineries produce these fuels and other products from crude oil and blending components. Transportation fuel production in California depends on the availability and quality of the crude oils used by refineries in the state. The supply of crude oil to California refineries has changed substantially in the last 10 years. Most notably, receipts of foreign crude oil have increased as production sources from California and Alaska have continued to decline (CEC, 2006c).

In the last two decades, California refineries have been running increasingly closer to capacity levels. Southern California refineries have also shown an increasing level of crude oil imports during this same period. In addition, refineries are also required to meet new diesel regulations promulgated by the U.S. EPA and CARB. The U.S. EPA lowered the allowable amount of sulfur in on-road diesel fuel from less than 500 ppm to less than 15 ppm. This requirement became effective in 2006. The sulfur content and American Petroleum Institute (API) gravity of crude oil input to the Refinery in conjunction with the complexity of process units will affect the quantity of ULSD produced by the facility. The hydrocracking and hydrotreater units recover sulfur at the Refinery. Recovered sulfur is converted into elemental sulfur for commercial sale. Hydrocracking units also break hydrocarbon molecules into lighter compounds in the presence of hydrogen. Refineries throughout the U.S. have upgraded their desulfurization processes in order to meet the new diesel sulfur standards. This upgrade typically involves techniques such as changing the catalyst in the hydrotreater or installing booster pumps to force more feedstock through the unit. Both hydrocrackers and hydrotreaters also remove heavy metals and aromatics from the feedstock. This is particularly important in California where lower aromatic standards will be required along with the new ULSD standards (CEC, 2006c).

3.3.2 REGULATORY BACKGROUND

Federal and state agencies regulate energy use and consumption through various programs. On the federal level, the U.S. DOT, United States Department of Energy (U.S. DOE), and U.S. EPA are three agencies with substantial influence over energy policies and programs. Generally, federal agencies influence transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy related research and development projects, and through funding for transportation infrastructure projects. On the state level, the California Public Utilities Commission (CPUC) and CEC are two agencies with authority over different aspects of energy. The CPUC regulates privately-owned utilities in the energy, rail, telecommunications, and water fields. The CEC collects and analyzes energy-related data, prepares state-wide energy policy recommendations and plans, promotes and funds energy efficiency programs, and regulates the power plant siting process. California is preempted under federal law from setting state fuel economy standards for new on-road motor

vehicles. Some of the more relevant federal and state transportation-energy-related laws and plans are discussed in the following subsections.

3.3.2.1 Federal Regulations

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. DOT, is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 miles per gallon. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is not determined for each individual vehicle model, but rather, compliance is determined on the basis of each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by U.S. EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The U.S. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the U.S. DOT is authorized to assess penalties for noncompliance.

In late 2007, CAFE standards received their first overhaul in more than 30 years. On December 19, President Bush signed into law the Clean Energy Act of 2007, which requires in part that automakers boost fleetwide gas mileage to 35 mpg by the year 2020. This requirement applies to all passenger automobiles, including “light trucks.” The bill signed into law December 2007 was an 822-page document changing U.S. energy policy in many areas. Key provisions were:

- Improved vehicle fuel economy.

- Increased CAFE standards. Automakers are required to boost fleetwide gas mileage to 35 miles per gallon (14.8 kilometers per liter) by 2020. This applies to all passenger automobiles, including “light trucks.”

- Improved vehicle technology and transportation electrification. Incentives for the development of plug-in hybrids.

- New conservation requirements for federal vehicle fleets.

- Increased production of biofuels. The total amount of biofuels added to gasoline is required to increase to 36 billion gallons by 2022, from the 4.7 billion gallons in 2007. The Energy Act specifies that 21 billion gallons of the 2022 total must be derived from non-cornstarch products (e.g., sugar or cellulose).

Intermodal Surface Transportation Efficiency Act

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) promoted the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA contained factors that Metropolitan Planning Organizations (MPOs), such as SCAG, were to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, MPOs adopted explicit policies defining the social, economic, energy, and environmental values that were to guide transportation decisions in that metropolitan area. The planning process for specific projects would then address these policies. Another requirement was to consider the consistency of transportation planning with federal, state, and local energy goals. Through this requirement, energy consumption was expected to become a decision criterion, along with cost and other values that determine the best transportation solution.

Transportation Equity Act for the 21st Century

The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation, discussed above. TEA-21 authorizes highway, highway safety, transit, and other surface transportation programs for the next six years. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

Clean Cities Program

The U.S. DOE's Clean Cities Program promotes voluntary, locally-based government/industry partnerships for the purpose of expanding the use of alternatives to gasoline and diesel fuel by accelerating the deployment of alternative fuel vehicles (AFVs) and building a local AFV refueling infrastructure. The Clean Cities Program has created more than 70 partnerships in communities throughout the country. Six of these partnerships have been established in the southern California region: Coachella Valley, Lancaster, Long Beach, Los Angeles, Northwest Riverside, and one administered by SCAG (SCAG, 2005).

3.3.2.2 State Regulations

State of California Integrated Energy Policy Report

In 2002, the Legislature reconstituted the State's responsibility to develop an integrated energy plan for electricity, natural gas, and transportation fuels. On November 1, 2003, and every two years thereafter, the CEC, in consultation with other State energy agencies, must provide an overview of the major energy trends and issues facing California, including supply, demand, price, reliability, and efficiency. It must assess the impacts of these trends and issues on public health and safety, the economy, resources, and the environment. Finally, it must make policy recommendations to the Governor and the Legislature that are based on an in-depth and integrated analysis of the most current and pressing energy issues facing the State (SCAG, 2005).

Reducing California's Petroleum Dependence

The CEC and CARB produced a joint report *Reducing California's Petroleum Dependence* to highlight petroleum consumption and to establish a performance based goal to reduce petroleum consumption in California over the next thirty years. The report includes the following recommendations to the Governor and Legislature regarding petroleum:

- Adopt the recommended statewide goal of reducing demand for on-road gasoline and diesel to 15 percent below the 2003 demand level by 2020 and maintaining that level for the foreseeable future.

- Work with the California delegation and other states to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles.

- Establish a goal to increase the use of non-petroleum fuels to 20 percent of on-road fuel consumption by 2020, and 30 percent by 2030.

The CEC will use these recommendations when developing its series of recommendations to the Governor and Legislature for the integrated energy plan for electricity, natural gas, and transportation fuels (SCAG, 2005).

Renewables Portfolio Standard

California's renewables portfolio standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least one percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. If a seller falls short in a given year, they must procure more renewables in succeeding years to make up the shortfall. Once a retail seller reaches 20 percent, they need not increase their procurement in succeeding years. The CEC and the CPUC are jointly implementing the standard.

California Environmental Quality Act

Appendix F of the CEQA Guidelines describes the types of information and analyses related to energy conservation that are to be included in EIRs that are prepared pursuant to the CEQA. In Appendix F of the CEQA Guidelines, energy conservation is described in terms of decreased per capita energy consumption, decreased reliance on natural gas and oil, and increased reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

3.4 HAZARDS AND HAZARDOUS MATERIAL

3.4.1 TYPES OF ON-SITE HAZARDS

In general, hazard impacts are not a discipline with specific environmental characteristics that can be easily described or quantified. Instead, hazard incidents consist of accidental occurrences that may create adverse effects on human health or the environment.

This section describes features of the existing environment as they relate to the risk of a major accident occurring at the Refinery. Factors which are taken into consideration to determine the magnitude of an upset event are as follows:

- The probability of an event occurring;
- The consequences of an event (exposures);
- The types of materials potentially involved in an upset event; and,
- The location of receptors e.g. residences, schools, and businesses that could be affected by upset events.

Potential hazards at a Refinery may include exposure to toxic gases, fires, vapor cloud explosions, thermal radiation, and overpressure. These hazards are described below.

Toxic gas releases: Toxic gas releases (e.g., ammonia and H_2S) could migrate off-site and create adverse health impacts to some exposed individuals. "Worst-case" conditions tend to arise when very low wind speeds coincide with accidental release, which can allow the chemicals to accumulate rather than disperse.

Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases): The rupture of a storage tank or vessels containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset occurs when a release occurs and produces a large aerosol cloud with flammable properties. If the

flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

Thermal Radiation: Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

Explosion/Overpressure: Process vessels containing flammable explosive vapors and potential ignition sources are present at refineries. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

Based on a review of the existing Refinery operations and processes, the greatest potential for an upset condition to occur that would affect the public would result from the ignition of flammable material. The chemicals considered to pose the greatest public health risks are pressurized gases such as LPG, which is stored in large quantities at the Refinery. Both radiant heat and blast overpressures could result from ignition of an LPG release. Other events that could have offsite impacts are the release and ignition of LPG from a pipeline rupture and release of ammonia from ammonia storage facilities. These types of events are the most likely to occur in an industrial environment such as a refinery and establish the environmental setting.

Chevron currently adheres to the following safety design and process standards:

- The California Health and Safety Code Fire Protection specifications.

- The design standards for petroleum refinery equipment established by American Petroleum Institute, American Society of Mechanical Engineers, the American Institute of Chemical Engineers, the American National Standards Institute, and the American Society of Testing and Materials.

- The applicable federal and CalOSHA requirements.

Chevron maintains its own emergency response capabilities, including onsite equipment and trained emergency response personnel who are available to respond to emergency situations anywhere within the Refinery.

The Refinery also has prepared a RMP for the, butane, pentane, ammonia and other hazardous materials that are currently used at the Refinery. The City of El Segundo Fire Department administers this program. As indicated above, the Refinery prepared an Emergency Response Manual to address RMP concerns. This manual describes the emergency response procedures that would be followed in the event of any of several

release scenarios and the responsibilities for key response personnel. The scenarios include the accidental release of the following:

- Ammonia stored in bulk tanks.
- Hydrogen sulfide as a component of various intermediate refinery streams.
- Natural gas or refinery fuel gas used throughout the Refinery involving both ignited and unignited vapors.
- LPG leaks involving both ignited and unignited vapors.
- Sulfuric acid used in the Alkylation Unit.
- Butane shipments from the facility.
- Constituents of the petroleum tanks that are located throughout the Refinery.

Modifications under the RMP and the California Accidental Release Prevention (CalARP) are required for covered processes if changes to usage or the process can reasonably be expected to produce a change by a factor of two in the distance to the endpoint for the off-site consequences analysis. Modifications are also required if there is a major change to the process requiring a new process hazard analysis.

Ammonia

Ammonia is the third highest volume chemical produced in the U.S. At atmospheric temperature and pressure, ammonia is a colorless gas with a distinct irritating odor. It is very soluble in water, which makes water useful in suppressing gaseous ammonia releases. Although ammonia is lighter than air, pressurized liquid ammonia released to the atmosphere initially forms a dense, cold ammonia mist. Depending on the concentration of the released ammonia, its vapors can irritate mucous membranes. If inhaled in large amounts, ammonia may injure the lungs, with possibly fatal results. Although ammonia is a flammable gas, high concentrations are required for ignition, so flammability typically is not a concern. Chevron has an on-site ammonia recovery plant which manufacturers and stores ammonia in an aqueous solution until it is used in NOx control systems or SCR systems at the Refinery. In addition, Chevron transports aqueous ammonia off-site for distribution to other users.

Anhydrous ammonia is a designated Acutely Hazardous Material (AHM). Because aqueous ammonia is much less hazardous than anhydrous ammonia, anhydrous ammonia applications at the Refinery, such as SCR systems, have been converted to aqueous ammonia applications.

Hydrogen Sulfide, Hydrogen

H_2S and hydrogen are produced and consumed in the refining process, but are not stored in substantial quantities because they are gases at standard temperature and pressures.

Liquefied Petroleum Gas (LPG)

LPG is the only pressurized chemical posing a risk of explosion at the Refinery. LPG (propane and butane) is stored at the Refinery, and LPG is transported into and out of the Refinery on a regular basis via trucks and rail cars.

The most serious accidents likely to occur at the Refinery would involve: stored LPG in an unconfined vapor cloud explosion (UVCE) due to failure of two-inch or smaller piping or fittings, an instantaneous release from a full catastrophic rupture of a storage sphere, or a boiling liquid expanding vapor explosion (BLEVE) resulting from structural failure of a sphere. The instantaneous release would yield worst-case overpressures and the BLEVE would yield worst-case radiant heat fluxes. The major LPG storage area within the Refinery is just to the northeast of the ISOMAX Complex. The LPG spheres are located a minimum of about 1,150 feet from the nearest property line – about 2,200 feet from the nearest residences – and are spaced about 50 feet apart.

Chevron's LPG storage facilities comply with American National Standards Institute (ANSI) and API standards requiring spheres with capacities greater than 12,500 barrels to be at least 200 feet from the nearest property line and spaced at least three feet apart. The supporting legs of the spheres are fireproofed to provide four hours of fire resistance, doubling API standards. The spheres have internal water injection systems that would, in the event of a leak in the supply or discharge piping or bottom connections, fill the bottom portion of the tank and raise the LPG level above the point of leakage, so that water would leak instead of LPG.

Drainage around the tanks is designed to prevent pooling of liquids beneath the tanks, and to conduct released liquids to an impoundment area. Fixed cooling water systems would provide a water film on the upper, gas-phase portions of the tanks, in case of a fire, and monitors provide a water spray to cool the lower portions of the tanks; the design water delivery rate is at least 0.25 gallon per minute per square foot.

3.4.2 TRANSPORTATION RISKS

Regulations for the transport of hazardous materials by public highway are described in 49 CFR 173 and 177. Although the transport of hazardous materials is regulated for safety by the U.S. DOT, there is a possibility that a tanker truck could be involved in an accident spilling its contents. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, and driver training. A common reference frequently used in

measuring probable risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of probable risk is the fact that some accidents can cause significant damage without injury or fatality.

Every time hazardous materials are moved from the site of generation, opportunities are provided for accidental (unintentional) release. A study conducted by the U.S. EPA indicates that the expected number of hazardous materials spills per mile shipped ranges from one in one million to one in 100 million, depending on the type of road and transport vehicle used. The U.S. EPA analyzed accident and traffic volume data from New Jersey, California, and Texas, using the Resource Conservation and Recovery Act Risk/Cost Analysis Model and calculated the accident involvement rates presented in Table 3-6. The study concluded that the release rate for tank trucks is much lower than for any other container type (Los Angeles County, 1988). The data in Table 3-6 are for all types of trucks.

TABLE 3-6

Truck Accident Rates for Cargo on Highways

Highway Type	Accidents Per 1,000,000 miles
Interstate	0.13
U.S. and State Highways	0.45
Urban Roadways	0.73
Composite*	0.28

* Average number for transport on interstates, highways, and urban roadways.

3.4.3 REGULATORY BACKGROUND

There are many federal and state rules and regulations that refineries and petroleum storage facilities must comply with which serve to minimize the potential impacts associated with hazards at these facilities. The most important and relevant regulations relative to hazards are summarized in the following paragraphs.

Under OSHA regulations (29 CFR Part 1910), facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR Part 1910.119, PSM of Highly Hazardous Chemicals, and Title 8 of the CCRs, General Industry Safety Order §5189, specify required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive or explosive materials. Prevention program elements are aimed at preventing or minimizing the consequences of catastrophic releases of the chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop RMPs to prevent accidental releases of these substances, U.S. EPA regulations are set forth in 40 CFR Part 68. In California, the CalARP Program regulation (CCR Title 19, Division 2, Chapter 4.5) was issued by the Governor's Office of Emergency Services (OES). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. RMPs for existing facilities were required to be submitted by June 21, 1999. Chevron has complied with the RMP requirements and has submitted the appropriate reports. The El Segundo Fire Department administers the CalARP program for the Refinery. The Refinery is also required to comply with the U.S. EPA's Emergency Planning and Community Right-to-Know Act (EPCRA), which requires annual reporting of releases from the Refinery and specific requirements in the event of an emergency release.

All Refinery facilities are required to have a SPCC Plan per the requirements of 40 Code of Federal Regulations, Section 112. The SPCC Plan is designed to prevent spills from on-site facilities and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth. Additional spill equipment is available through commercial contracts with suppliers that specialize in spill cleanup. Commercial contractors that specialize in oil cleanup are employed to place any additional booms or other spill capture equipment, if necessary, and to remove oil from the water, if the oil is released into waterways.

The Hazardous Materials Transportation (HMT) Act is the federal legislation that regulates transportation of hazardous materials. The primary regulatory authorities are the U.S. DOT, the Federal Highway Administration, and the Federal Railroad Administration. The HMT Act requires that carriers report accidental releases of hazardous materials to the DOT at the earliest practical moment (49 CFR Subchapter C). Incidents which must be reported involve deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The Caltrans sets standards for trucks in California. The regulations are enforced by the California Highway Patrol.

California Assembly Bill 2185 requires local agencies to regulate the storage and handling of hazardous materials and requires development of a plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments), an inventory of the hazardous materials, an emergency response plan, and an employee training program. The business plans must provide a description of the types of hazardous materials/waste on-site and the location of these materials. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

3.5 HYDROLOGY AND WATER QUALITY

3.5.1 WATER SUPPLY

Water issues in the Los Angeles Basin are complex and affect supply, demand, and quality of water for domestic, commercial, industrial, and agricultural use. Since 1900, extensive water development has been carried out in the Los Angeles Basin. The Los Angeles Aqueduct, which imports water from the Owens Valley, was completed in 1913 and extended to the Mono Lake Basin in 1940. Due to restrictions on diversions from the Mono Basin and Owens Valley, the amount of water that can be diverted to the Los Angeles area has been reduced.

The Colorado River Aqueduct, which now provides approximately 25 percent of the region's water supply, was completed in 1941. Contracts allow the diversion of 1.21 million acre-feet per year to the Los Angeles area. Approximately 750,000 acre-feet were diverted by the Metropolitan Water District of Southern California during 2004.

In an average year, 70 to 75 percent of the water used in the Los Angeles area is imported from the Colorado River, the State Water Project via the California Aqueduct, and the eastern Sierras via the Los Angeles Aqueduct. Wells in the San Fernando Valley and other local groundwater basins supply approximately 15 percent of the water.

Between July 2004 and June 2005, approximately 2.06 million acre-feet of water were provided to the southern California area. About two-thirds of the water demand is for residential uses. About one-quarter of the demand is for commercial and governmental uses. Therefore, industrial use represents a small part of the overall water use in the Los Angeles area.

The Refinery currently consumes approximately 10 million gpd of water. Approximately 2.6 million gpd of fresh/potable water, which is purchased from the WBMWD, is used. In addition, approximately 7.5 million gpd of reclaimed water, which is also purchased from the WBMWD, is consumed. The WBMWD applies tertiary treatment to the secondary-treated effluent from the City of Los Angeles Hyperion Treatment Plant. Approximately 200,000 gpd of reclaimed water is used for irrigation of Refinery landscaping, approximately 3.5 million gpd of denitrified reclaimed water is used for the cooling towers, and approximately 3.8 million gpd of reclaimed water is used for boiler feed water.

3.5.2 WASTEWATER GENERATION

The Chevron Refinery is located adjacent to the Santa Monica Bay on the Pacific Ocean. The Bay is recognized by the U.S. EPA and the State as a natural resource of national significance. Effluent Limitations and Performance Goals are established in Chevron's NPDES Permit (No. CA0000337) for the protection of marine aquatic life and human health.

Refinery wastewater is currently collected and treated in two separate drain and treatment systems: a segregated system and an unsegregated system. The unsegregated system, which consists of an API separator and induced air flotation (IAF) units, is normally used for non-process wastewater, including cooling tower blowdown, steam condensate, a portion of the water pumped from groundwater recovery wells, and other wastewater streams containing free oil recovered with primary (physical) treatment only. Primary treatment consists of the separation of oil, water, and solids in two stages. During the first stage (API separator), wastewater moves very slowly through the separator allowing free oil to float to the surface and be skimmed off and solids to settle to the bottom. Periodically, the separator is shut down and the sludge is collected for disposal. The second stage utilizes an IAF unit, which bubbles air through the wastewater, and both oil and suspended solids are skimmed off the top. The unsegregated system is also used to collect and treat stormwater. Both structural (impoundments, berms, and curbs) and non-structural (inspections and training) controls are used to keep contaminants from entering the unsegregated system. The unsegregated system can be operated such that flow can be diverted to effluent diversion tankage or to the segregated treatment system, where additional treatment can be performed.

The segregated system is normally used to treat process wastewater containing emulsified oil, organic chemicals, and a portion of the water pumped from groundwater recovery wells. This system consists of gravity separators, a DAF unit, and activated sludge units for secondary (biological) treatment. In secondary treatment, dissolved oil and other organic pollutants may be consumed biologically by microorganisms. Effluent that does not meet the discharge limits may receive additional solids removal from an auxiliary off-specification DAF unit or be routed to two auxiliary effluent diversion tanks for additional IAF treatment. The biosolids from the biological treatment are disposed to the sanitary sewer for treatment by the Hyperion Treatment Plant under an Industrial Waste Discharge Permit.

Two auxiliary effluent diversion tanks are available for handling wastewater from either of the two systems and excess storm-water runoff. During severe rainstorms, excess runoff is collected and pumped into the diversion tanks, which have a holding capacity of about 13.8 million gallons. From the tanks, water can be routed to either system for treatment prior to discharge.

Under its NPDES Permit, the Chevron Refinery is authorized to discharge up to 8.8 million gpd of treated wastewater during dry weather and up to 23 million gpd during wet weather to the Santa Monica Bay, near Dockweiler State Beach in El Segundo. The wastewater is discharged through an outfall that is located approximately 3,500 feet offshore. Currently, the Refinery discharges approximately seven million gpd of treated wastewater during dry weather.

3.5.3 REGULATORY BACKGROUND

The primary objective of the Federal Water Pollution Control Act, otherwise known as the Clean Water Act (CWA), is to restore and maintain the chemical, physical, and biological integrity of the nation's surface waters. This Act requires industries that discharge wastewater to municipal sewer systems to meet pretreatment standards. The regulations authorize the U.S. EPA to set the pretreatment standards. The CWA regulates three categories of pollutants "priority" pollutants, including various toxic pollutants; "conventional" pollutants, such as biochemical oxygen demand (BOD), total suspended solids (TSS), oil and grease, and pH; and "non-conventional" pollutants, including any pollutant not identified as either conventional or priority. The regulations also allow the local treatment plants to set more stringent wastewater discharge requirements, if necessary, to meet local conditions.

The CWA regulates both direct and indirect discharges. The NPDES Program (CWA §502) controls direct discharges into waters of the United States. NPDES permits contain industry-specific, technology-based limits and may also include additional water quality-based limits, and establish pollutant monitoring requirements. A NPDES permit may also include discharge limits based on federal or state water quality criteria or standards. In 1987, the CWA was amended to require a program to address storm water discharges. In response, the U.S EPA promulgated the NPDES storm water permit application regulations.

The Porter-Cologne Water Quality Act is the state of California's primary water quality control law. It implements the state's responsibilities under the Federal Clean Water Act, but also establishes state wastewater discharge requirements. The RWQCB administers the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits.

In response to the CWA, the SWRCB prepared two state-wide plans that address storm water runoff: the California Inland Surface Waters Plan and the California Enclosed Bays and Estuaries Plan. These Plans contain similar provisions and complement each other. Both establish numerous water quality objectives for water bodies. The California Enclosed Bays and Estuaries Plan specifies the Los Angeles-Long Beach Harbor (to which surface water from the Los Angeles River eventually flows) as an enclosed bay.

On June 13, 1994, the LARWQCB adopted an updated Water Quality Control Plan for the Los Angeles Region (LA Basin Plan). The LA Basin Plan incorporates by reference the SWRCB water quality control plans for ocean waters, control of temperature, significant SWRCB policies that are applicable to the Los Angeles Region, and the anti-degradation policy. The LA Basin Plan contains water quality objectives for, and lists the following beneficial uses of, water bodies in the vicinity of the Refinery:

- Nearshore Zone (Bounded by the shoreline and a line 1,000 feet from the shoreline or the 30-foot depth contour, whichever is farther from shore)

Existing Beneficial Uses: Industrial service supply, navigation, water-contact and non-water-contact recreation, ocean commercial and sport fishing, preservation of areas of special biological significance, preservation of rare and endangered species, marine habitat, shellfish harvesting, and fish spawning.

- Offshore Zone (Beyond the Nearshore Zone)

  Existing Beneficial Uses: Industrial service supply, navigation, water-contact and non-water-contact recreation, ocean commercial and sport fishing, preservation of rare and endangered species, marine habitat, and shellfish harvesting.

- Dockweiler Beach (Hydrologic Unit 405.12, specifically defined unit separate from the Nearshore Zone):

  Existing Beneficial Uses: Industrial service supply, navigation, water-contact recreation, non-water-contact recreation, commercial and sport fishing, marine habitat, and wild habitat.

  Potential Beneficial Uses: Spawning, reproduction, and/or early development of marine fishes

Because Chevron contains or treats all of its storm water flows, the only applicable requirement from the California General Storm Water Permit is to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). The Refinery has complied with this requirement. Additionally, a SPCC Plan and an approved Emergency Response Plan have been prepared for the Refinery.

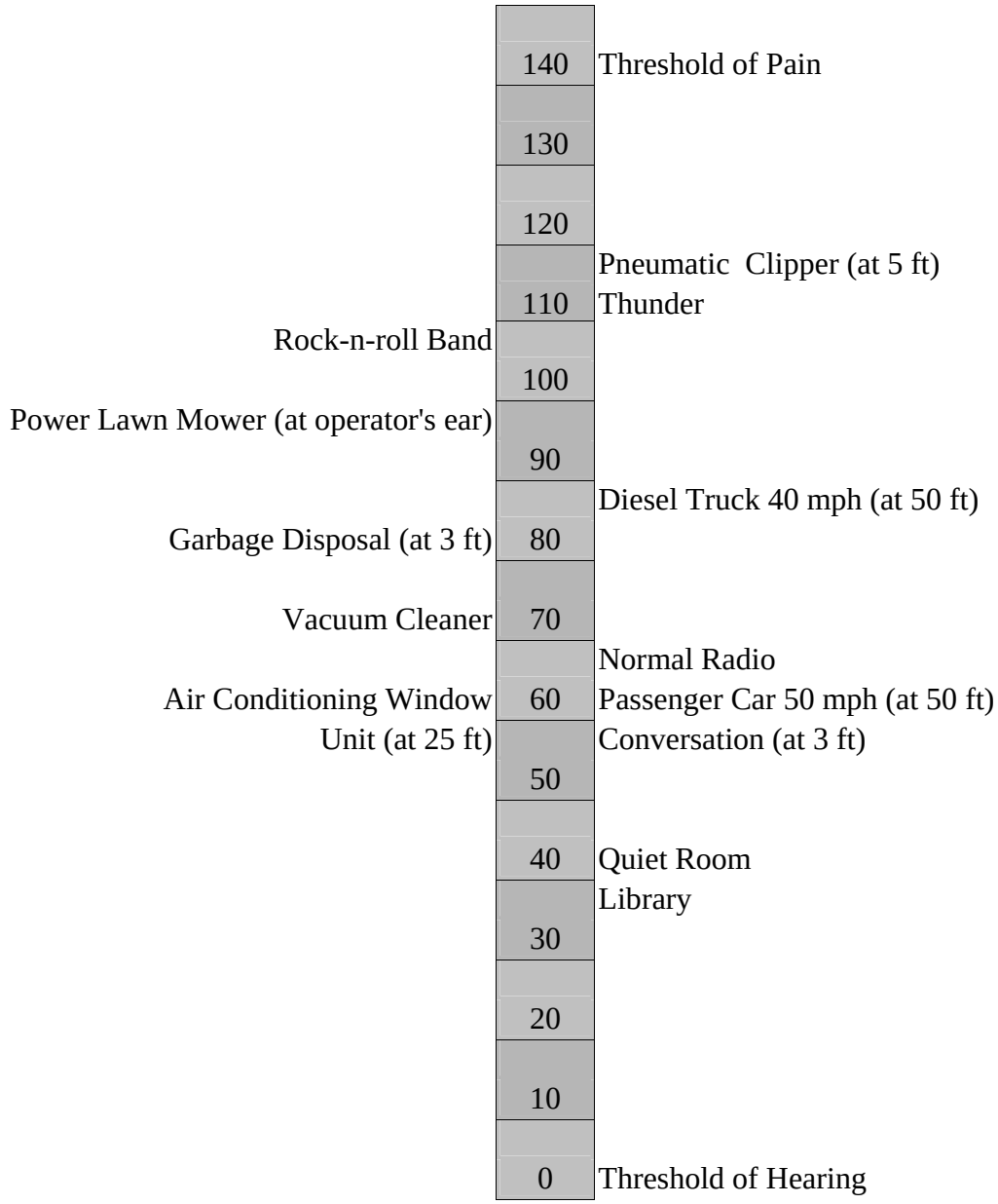
3.6 NOISE

3.6.1 INTRODUCTION

Noise is a by-product of urbanization and there are numerous noise sources and receptors in an urban community. Noise is generally defined as unwanted sound. The range of sound pressure perceived as sound is extremely large. The decibel is the preferred unit for measuring sound since it accounts for these variations using a relative scale adjusted to the human range for hearing (referred to as the A-weighted decibel or dBA). The A-weighted decibel is a method of sound measurement which assigns weighted values to selected frequency bands in an attempt to reflect how the human ear responds to sound. The range of human hearing is from 0 dBA (the threshold of hearing) to about 140 dBA which is the threshold for pain. Examples of noise and their A-weighted decibel levels are shown in Figure 3-2.

FIGURE 3-2

GENERAL NOISE SOURCES AND THEIR SOUND PRESSURE LEVELS



Sources: Industrial Noise Manual, 3rd Edition, AIHA, 1975; City of Long Beach, 1975

In addition to the actual instantaneous measurements of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. To analyze the overall noise levels in an area, noise events are combined for an instantaneous value or averaged over a specific time period. The time-weighted measure is referred to as equivalent sound level and represented by energy equivalent sound level (Leq). The percentage of time that a given sound level is exceeded also can be designated as L_{10}, L_{50}, L_{90}, etc. The subscript notes the percentage of time that the noise level was exceeded during the measurement period. Namely, an L_{10} indicates the sound level is exceeded 10 percent of the time and is generally taken to be indicative of the highest noise levels experienced at the site. The L_{90} is that level exceeded 90 percent of the time and this level is often called the base level of noise at a location. The L_{50} sound (that level exceeded 50 percent of the time) is frequently used in noise standards and ordinances.

The sound pressure level is measured on a logarithmic scale with the 0 dBA level based on the lowest detectable sound pressure level that people can perceive. Decibels cannot be added arithmetically, but rather are added on a logarithmic basis. A doubling of sound energy is equivalent to an increase of three dBA. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged twice as loud. In general, a three to five dBA change in community noise levels starts to become noticeable, while one-two dBA changes are generally not perceived (City of Los Angeles, 1998).

The State Department of Aeronautics and the California Commission of Housing and Community Development have adopted the Community Noise Exposure Levels (CNEL) to measure and regulate noise sources within communities. The CNEL is the adjusted noise exposure level for a 24-hour day and accounts for noise source, distance, duration, single event occurrence frequency, and time of day. The CNEL considers a weighted average noise level for the evening hours, from 7:00 p.m. to 10:00 p.m., increased by five dBA (i.e., an additional five dBA is added to all actual noise measurements), and the late evening and morning hour noise levels from 10:00 p.m. to 7:00 a.m., increased by 10 dBA (an additional 10 dBA is added to all actual noise measurements). The daytime noise levels are combined with these weighted levels and averaged to obtain a CNEL value. Using this formula, the CNEL weighted average noise level weights noise measurements taken in the evening and nighttime hours more heavily than noise during the daytime. The adjustment accounts for the lower tolerance of people to noise during the evening and nighttime period relative to the daytime period.

3.6.2 REFINERY EXISTING NOISE LEVELS

Land use in the vicinity of the Refinery is generally designated commercial and residential to the north; industrial, open, and public land to the east; residential to the south; and industrial to the west. The ambient noise environment in the project vicinity is composed of the contributions from equipment and operations within these commercial and industrial areas, and from the traffic on roadways along or near each of its property boundaries (El

Segundo Boulevard, Sepulveda Boulevard, Rosecrans Avenue, and Vista Del Mar Avenue). Vehicular traffic is heavy on Sepulveda Boulevard and Rosecrans Avenue, which border the Refinery to the east and south, respectively, and dominates the local noise environment.

The Union Pacific and BNSF railroads both operate daily to the Chevron Refinery and to other nearby industries. For Chevron, switching operations are located within the confines of the Refinery. Railroads in El Segundo do not pass through residential areas, so that rail traffic does not appear to contribute significantly to the existing community noise environment. Aircraft noise associated with the LAX affects the northwestern portion of the City of El Segundo.

The nearest sensitive noise receptors south of the Refinery are residences located in the City of Manhattan Beach, approximately 200 to 400 feet south of the Refinery along Rosecrans Avenue. The nearest sensitive noise receptors north of the Refinery are commercial receptors along El Segundo Boulevard and residences along Lomita Avenue and Grant Avenue approximately one-eighth mile north of the Refinery.

A noise survey was performed on October 5 through October 9, 2007 to determine the existing ambient noise levels in the vicinity of the Refinery. The noise monitoring locations are summarized in Table 3-7 and shown on Figure 3-3.

TABLE 3-7

Noise Survey Locations

Location	Description
1 (NMT#1)*	Located on the south-west berm, adjacent to Rosecrans Ave., close to Chevron Gate 22.
2 (NMT #2)	Located on the western property line by Crest Drive and 45th Street in Manhattan Beach.
3 (NMT #3)	Located on the north property line, adjacent to El Segundo Blvd, near the Chevron Administration Building.
4 (NMEWS #1)	Located on the south-central side of the Refinery, adjacent to Rosecrans Avenue and north of the berm.
5 (NMEWS #2)	Located on the south-east side of the Refinery, adjacent to Rosecrans Ave. and south of Sepulveda Blvd. and north of the berm by the electrical sub-station.

***** Locations identified in the noise survey (see Appendix E)

All noise monitors used during the environmental noise survey meet the American National Standards Institute (ANSI) S1.4, 1983 specification for Type I (precision) sound level meters. Each monitor is calibrated on an annual basis in accordance with the National Institute of Standards Technology. The results of the noise survey are summarized in Table 3-8 and are further discussed in Appendix E.


CHEVRON
EL SEGUNDO REFINERY
CHEVRON EL SEGUNDO REFINERY
Noise Monitoring Locations
LEGEND
① Noise Monitoring Locations
ENVIRONMENTAL AUDIT, INC.
Source: Microsoft
N
E Grand Ave
E El Segundo Blvd
S Sepulveda Blvd
Rosecrans Ave
Illinois St
Oregon St
Nevada St
E Franklin Ave
Penn St
Sheldon St
Arena St
Standard St
Richmond St
Concord St
W El Segundo Blvd
W Grand Ave
W Franklin Ave
Vista del Mar
Crest Dr
Highland Ave
El Porto
The Strand
36th Pl
36th St
38th St
39th St
40th St
41st St
42nd St
Shell St
Gulf St
45th St
The Lakes at el Segundo
Outer Loop Rd
Aviation Way
Project No. 2505
N:\2505-1\NoiseMonitoringLocations (rev.1).cdr
Figure 3-3

TABLE 3-8

Ambient Noise Levels

Date	Noise Levels at Each Station (CNEL in dBA)				
	1	**2**	**3**	**4**	**5**
10/5/07	63.7	61.9	68.7	68.0	63.8
10/6/07	64.2	61.7	68.8	69.1	63.9
10/7/07	65.3	65.5	69.7	69.1	64.3
10/8/01	63.5	60.4	68.9	69.2	63.8
10/9/07	63.4	66.7	69.1	68.2	63.8
Average	64.0	63.3	69.0	68.7	63.9
Max	65.3	66.7	69.7	69.2	64.3
Min	63.4	60.4	68.7	68.0	63.8

Based on the noise survey, the ambient property line background noise level CNEL ranges between about 63 dBA and 69 dBA. The lowest noise levels are found on the south side of the Refinery adjacent to Rosecrans Avenue (noise monitoring location 5), adjacent to the residential areas located on the south side of Rosecrans Avenue and near these residential/commercial areas west of the Refinery (noise monitoring location 2). The existing CNEL in the residential areas are about 6-643 dBA, which is in the "normally acceptable" to "conditionally acceptable" range for residential land use categories. The highest noise levels are found on the northern property line adjacent to El Segundo Boulevard (noise monitoring location 3), which is mostly commercial land uses. The existing CNEL in the vicinity of commercial areas to the north of the Refinery are considered to be "conditionally acceptable to "normally unacceptable" range for commercial land uses.

3.6.3 REGULATORY BACKGROUND

The noise guidelines and ordinances that are applicable to the Chevron Refinery are those adopted by the City of El Segundo and are summarized in Table 3-9. In addition, most community local noise elements contain land use compatibility standards required by the State of California. Figure 3-4 shows state land use categories and the recommended noise levels associated with each (California, 2003).

3.6.3.1 City of El Segundo

The Refinery is located within the City of El Segundo . El Segundo's Municipal Code 7-2-4 (City of El Segundo, 1996) limits noise based on increases to the ambient sound level. El Segundo limits are specified for two zone types: residential and commercial/industrial. The properties adjacent to the Refinery in the City of El Segundo are a mix of commercial and industrial, with residential areas beyond the commercial and industrial areas. As summarized in Table 3-9, noise increases are limited in residential zones to five dBA above

ambient (existing) sound level and eight dBA above ambient for commercial or industrial zones during both construction and operation.

TABLE 3-9

Local Noise Guidelines and Ordinances

City	Construction Limit	Operations Limit (exterior dBA unless noted)
El Segundo	Residential[1]: L_{eq}= 5 dBA over ambient noise level; Commercial/Industrial[1]: L_{eq}= 8 dBA over ambient noise level; OR Exempt if: Construction L_{50}= 65 dBA, and No construction noise occurs: 6:00 p.m. to 7:00 a.m., or Sundays and holidays	Residential[1]: L_{eq}= 5 dBA over ambient noise level; Commercial/Industrial[1]: L_{eq}= 8 dBA over ambient noise level
Manhattan Beach[2]	Construction allowed: Monday through Friday 7:30 a.m. to 6:00 p.m., Saturday 9:00 a.m. to 6:00 p.m.	Residential[1,3,4]: L_{eq}= 55 dBA (7 a.m.. to 10 p.m.) L_{eq}= 50 dBA (10 p.m. to 7 a.m.) Commercial[1,3,4]: Residential limits + 15 dBA Industrial[1,3,4]: Residential limits + 20 dBA

[1] Additional limits: $L_{50} = L_{eq}$; $L_{25} = L_{50}$ + 5 dBA; $L_{8.3} = L_{50}$ + 10 dBA; $L_{1.7} = L_{50}$ + 15 dBA; $L_{<1.7}$ or $L_{max} = L_{50}$ + 20 dBA

[2] The Refinery is located within the City of El Segundo and subject to the El Segundo Noise Ordinance. The Manhattan Beach Noise Ordinance is provided for reference only.

[3] If ambient noise exceeds limit then limit is increased to ambient noise

[4] Tonal or impulsive type noise also reduces limit by 5 dBA

L_x, - A-weighted sound level, L, that may not be exceeded more than "x" percent of any one hour time period

L_{eq} – Exterior equivalent sound level

L_{max} – Maximum A-weighted sound level

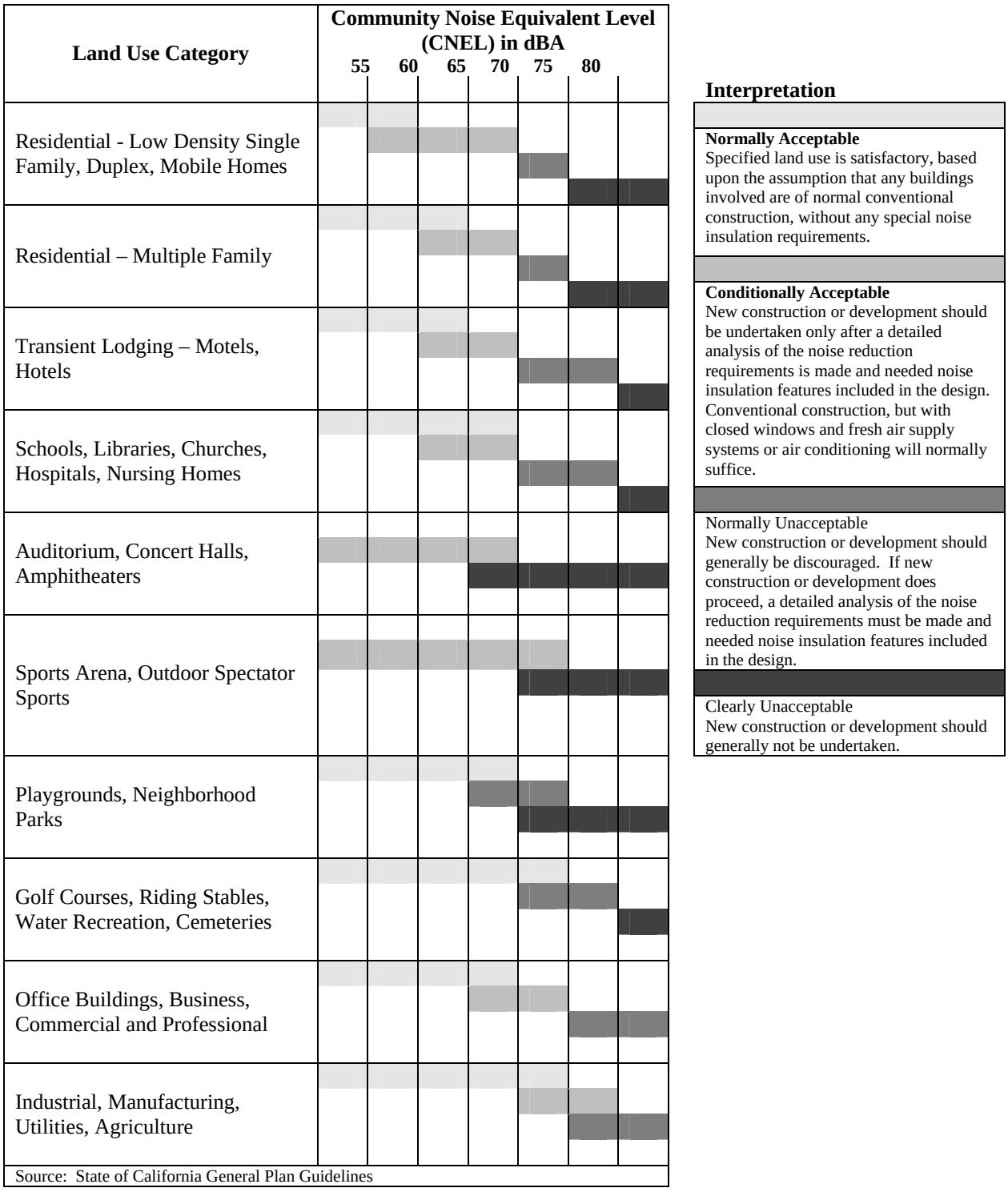
As specified in 7-2-10D of the Municipal Code, construction noise may be exempted from having to meet 7-2-4 requirements if it does not cause a disturbance at night (6:00 p.m. to 7:00 a.m.) or on Sundays or Federal holidays, and is less than 65 dBA at the receptor. However, since portions of the construction for the proposed project may occur at night, it will not be exempt from the requirements of Section 7-2-4 of El Segundo's Municipal Code.

3.6.3.2 City of Manhattan Beach

The City of Manhattan Beach is located adjacent to the southern boundary of the Refinery. Section 5.48.160 of Chapter 5.48 (Noise Regulations) of the Manhattan Beach Municipal Codes (City of Manhattan Beach, 1999) limits operational noise to specific statistical sound levels, L_x, where "L" is the A-weighted sound level that may not be exceeded over "x"

FIGURE 3-4

Land Use Compatibility for Community Noise Environments



Source: State of California General Plan Guidelines

percent of the measured time period. Specifically, the Manhattan Beach noise ordinance limits operational noise to a 60-minute L_{50}, L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}. The Manhattan Beach noise ordinance also specifies limits for the exterior L_{eq}. The properties in the vicinity of the Refinery in the City of Manhattan Beach are primarily residential, with commercial development farther away from the Refinery. Noise limits for these zones are summarized in Table 3-9.

Section 5.48.060 limits construction activity within the city to Monday through Friday from 7:30 a.m. to 6:00 p.m. and Saturday from 9:00 a.m. to 6:00 p.m. but does not impose an actual noise limit during those times. No construction noise is permitted on Sunday. Under Section 5.48.250, construction activities are exempted fromthe other provisions of the noise ordinances. Thus, the City of Manhattan Beach Municipal Codes do not specify noise limits specifically for construction noise.

Since the Refinery is located within the boundaries of the City of El Segundo, the El Segundo Noise Ordinance applies to the proposed project.

3.7 SOLID/HAZARDOUS WASTE

3.7.1 Non-Hazardous Solid Waste

A total of 11 Class III ("household waste") active landfills and two transformation facilities (waste-to-energy) are located within Los Angeles County with a total capacity of 31,077 tpd and 1,811 tpd, respectively. In 2005, the residents and businesses of Los Angeles County disposed of approximately 12.3 million tons of solid waste per year at existing permitted land disposal and transformation facilities located in and out of the County. Of this amount, approximately 9.7 million tons were disposed of in local Class III landfills, 0.6 million tons were sent to transformation facilities, 2.2 million tons were exported to Class III landfills outside of Los Angeles County. An additional 170,000 tons were disposed of at permitted unclassified (inert) landfills. The disposal quantities for solid waste generated in Los Angeles County translate into an average disposal rate of approximately 33,367 tpd (six day week) county-wide: 31,077 tpd at Class III Landfills: 1,812 tpd at waste-to-energy facilities: 478 tpd at permitted unclassified landfills (LACDPW, 2007) (see Table 3-10).

As of January 2006, the total remaining permitted Class III landfill capacity in Los Angeles County is about 104 million tons (see Table 3-10). Based on the 2005 approximate average disposal rate of 31,000 tpd (six day week), excluding waste being imported to the County, the LACDPW anticipates that landfill capacity in the county could be exceeded in approximately 10.8 years. Because of community resistance to the extension of operating permits for existing facilities and to the opening of new landfills in the county, and the dwindling capacity of those landfills with operating permit time left, the exact date on which that capacity will be exceeded is uncertain. In order to make a realistic assessment of the adequacy of the remaining Class III disposal capacity, many factors beyond mere mathematical limits must be taken into consideration. For any given facility these factors

include: expiration of the Land Use Permit; Waste Discharge Requirements Permit; Solid Waste Facilities Permit; air quality permits; restrictions on the acceptance of waste generated outside jurisdictional or wasteshed boundaries; permit restrictions on the amount

TABLE 3-10

LOS ANGELES COUNTY LANDFILL STATUS

LOS ANGELES COUNTY	Total Waste Disposed 2005 (tons)	2005 Average Tons per Day (tpd)	Average Tons per 6 Day Week	Permitted tons/day	Remaining Permitted Capacity (million tons) (as of 1/01/06)	Estimated Life Or Year of Closure[1]
CLASS III LANDFILLS						
Antelope Valley #1	371,000	1,189	7,134	1,400	10.21	26 years
Bradley[2]	270,000	864	5,184	10,000	0.09	Closed 4/07
Burbank (Burbank use only)	42,000	133	798	240	3.00	2053
Calabasas (Calabasas Watershed use only)	553,000	1,772	10,632	3,500	8.81	15 years
Chiquita Canyon	1,549,000	4,965	29,790	6,000	13.74	8 years
Lancaster	469,000	1,503	9,018	1,700	17.66	5 years[3]
Pebbly Beach (Avalon)	3,000	10	60	49	0.10	2033
Puente Hills #6	3,913,000	12,543	73,518	13,200	32.30	7 years
Scholl Canyon (Scholl Canyon Watershed use only)	453,000	1,452	8,712	3,400	6.80	14 years
Sunshine Canyon (County)	1,411,000	4,521	27,126	6,600	1.95	1 year[4]
Sunshine Canyon (City) [5]	571,000	1,831	10,986	5,500	5.33	4 years[4]
Savage Canyon - Whittier	92,000	294	1,764	350	4.60	2025
TOTALS	**9,697,000**	**31,077**	**184,722**	**51,939**	**104.59**	
UNCLASSIFIED LANDFILLS						
Azusa Land Reclamation Co.	164,000	460	2,760	6,500	36.54[6]	2025[7]
Peck Road Gravel Pit	6,000	18	108	1,210	9.79	Closed 1/08[7]
TOTALS	**170,000**	**478**	**2,868**	**7,710**	**46.33**	
TRANSFORMATION FACILITIES						
Commerce Refuse to-Energy Facility	101,000	325	1,950	1,000	466.64	15 years[8]
Southeast Resource Recovery Facility	484,000	1,487	8,922	2,240	1,602.45	15 years[8]
TOTALS	**585,000**	**1,812**	**10,872**	**3,240**	**2069.09**	

Sources: CIWMB web site: www.ciwmb.cs.gov/SWIS; *2005 Annual Report, LAC Countywide Integrated Waste Management Plan*, LACPDW, June 2007 (LACDPW, 2007).

Notes: (1) As January 1, 2007 as cited in LACPDW, 2007; (2)The Bradley landfill closed in April 2007; (3) Current CUP expires in August 2012; (4) On 2/6/07,the Board of Supervisors approved a new CUP establishing a 30-year life. Provided certain conditions are met, the total available capacity of the combined landfills is 74.3 million tons; (5) City of LA portion opened July 2005, currently operating at 4,400 tpd; (6) By Court order, on 10/2/96, the RWQCB ordered the Azusa Land Reclamation Landfill to stop accepting MSW. Permitted daily capacity of 6,500 tpd consists of 6,000 tpd of refuse and 500 tpd of inert waste. Facility currently accepts inert waste only; (7) per CIWMB web site: www.ciwmb.cs.gov/SWIS; (8) Assumed to remain operational during the 15-year planning period, LACPDW, 2007, Appendix E-2.1.

of waste that can be accepted daily or weekly, geographic barriers; and the amount of waste that can be handled on a daily basis due to limits of manpower and equipment (LACDPW, 2007). The LACSD is currently exploring out-of-county disposal options in addition to continuing negotiations to extend current operating permits.

The total remaining permitted inert waste capacity in Los Angeles County was estimated at approximately 46 million tons. Los Angeles County is planning two new inert waste facilities in Irwindale (United Rock Pit #3 and Irwindale Rock Plant D.S.). There is expected to be adequate disposal capacity at unclassified landfills and no inert landfill crisis currently exists. There are currently two waste-to-energy facilities (i.e., incinerators) in Los Angeles County with a combined permitted daily capacity of 1,800 tons (six-day week). It is expected that these two facilities will operate at their current permitted daily capacity until the equipment life of the waste-to-energy facilities (incinerators) is exhausted (LACDPW, 2007).The Los Angeles Integrated Waste Management Board (LAIWMB) 2005 Annual Report on the Countywide Summary Plan and Countywide Siting Element (LACDPW, 2007) reports on the expansion of the Puente Hill Landfill, which would extend its life by another 10 years. The Annual Report also proposes expansions of the Sunshine Canyon, Lancaster, Antelope Valley, and Peck Road landfills. The idea of transporting waste via railroad from the site of its generation to more remote or distant locations (some of them out of state) is being given serious consideration as part of waste disposal planning. It would provide jurisdictions in Los Angeles County with access to a greater array of landfills than would otherwise be accessible or cost effective. In theory, rail-haul has the potential to reduce labor costs, equipment, vehicle costs, and the amount of time typically associated with the transportation of waste to remote, non-urban locations by truck. Excluding proposed new or expanded facilities, current landfill capacity is expected to be sufficient to serve the county's landfill needs for the next 10.8 years (LADWP, 2007).

3.7.2 HAZARDOUS WASTE MANAGEMENT

Hazardous material, as defined in 40 CFR 261.20 and 22 CCR Article 9, is disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills. The California Health and Safety Code requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a ground water monitoring system.

There are no hazardous waste disposal sites within Los Angeles County. Hazardous waste generated at area facilities, which is not reused on-site, or recycled off-site, must be disposed of at a licensed hazardous waste disposal facility. Two such facilities in California are the CWMI's Kettleman Hills facility in King's County, and the Clean Harbors (formerly Safety-Kleen) facility in Buttonwillow (Kern County). Kettleman Hills receives an average of 2,700 tpd and has an estimated two million cubic yard capacity. The facility is expected to continue receiving wastes for approximately three years without an expansion, or 25 years with an expansion. The facility is in the process of permitting a landfill expansion which would increase the landfill's life by another five years. The facility operators would then seek a permit for development of a new landfill that would

create another 15 years of life (Email Communication, Fred Paap, Chemical Waste Management Inc., September 2007). Buttonwillow receives approximately 960 tons of hazardous waste per day and has an approximate remaining capacity of approximately 8.8 million cubic yards. The expectant life of the Buttonwillow Landfill is approximately 40 years (Personal Communication, Marianna Buoni, Clean Harbors Buttonwillow, Inc., September 2007).

Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; and Envirosafe Services of Idaho, Inc., in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, located in Aragonite, Utah; Aptus, located in Coffeyville, Kansas; Rollins Environmental Services, Inc., located in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co., Eau Claire, Wisconsin.

About 782 thousand tons of hazardous waste were generated in 2007 in Los Angeles County (see Table 3-11). The most common types of hazardous waste generated in the County include waste oil, organic solids, inorganic solid waste, contaminated soils, and asbestos-containing waste. Because of the population and economic base in southern California, a large portion of hazardous waste is generated within Los Angeles County. Not all wastes are disposed of in a hazardous waste facility or incinerator. Many of the wastes generated, including waste oil, are recycled within the Los Angeles Basin.

TABLE 3-11

Hazardous Waste Generation in Los Angeles County - 2007

Waste Name	Total tonnage of hazardous waste disposed
Waste Oil	268,445
Organic Solids	173,891
Inorganic Solid Waste	129,087
Contaminated Soils	82,683
Asbestos Waste	51,086
Aqueous Solution with Organic Residues	20,050
Unspecified Oil-Containing Waste	19,170
Unspecified Aqueous Solution	15,628
Oil/Water Separation Sludge	11,240
Off-spec, Aged, or Surplus Organics	10,266
TOTAL	**781,546**

(1) Source: hwts.dtsc.ca.gov/report_list.cfm, DTSC, 2008.

3.7.3 REGULATORY BACKGROUND

The California Environmental Protection Agency, DTSC is responsible for the permitting of transfer, disposal, and storage facilities. The DTSC conducts annual inspections of hazardous waste facilities. Other inspections can occur on an as-needed basis.
The California Department of Transportation sets standards for trucks in California. The regulations are enforced by the California Highway Patrol. Trucks transporting hazardous wastes are required to maintain a hazardous waste manifest and to register as hazardous waste haulers. The manifest is required to describe the contents of the material within the truck so that wastes can readily be identified in the event of a spill.

The California Integrated Waste Management Act of 1989 (AB939), as amended, requires each county to prepare a countywide siting element which identifies how the county and the cities within the county will address the need for 15 years of disposal (landfill and/or transformation) capacity to safely handle solid waste generated in the county which remains after recycling, composting, and other waste diversion activities. AB 939 has recognized that landfills and transformation facilities are necessary components of any integrated solid waste management system, and an essential component of the waste management hierarchy. AB 939 establishes a hierarchy of waste management practices in the following order and priority: (1) source reduction; (2) recycling and composting; and (3) environmentally safety transformation/land disposal.

The Los Angeles Countywide Siting Element addresses landfill disposal. The purpose of the Countywide Siting Element is to provide a planning mechanism to address the solid waste disposal capacity needed by the 88 cities in the Los Angeles County and unincorporated communities for each year of the 15-year planning period, through a combination of existing facilities, expansion of existing facilities, planned facilities, and other strategies. Other elements of waste management planning and practices include the Source Reduction and Recycling Element which is part of the Los Angeles County Integrated Waste Management Summary Plan (LACDWP, 2007).

Permit requirements, capacity, and surrounding land use are three of the dominant factors limiting the operations and life of landfills. Landfills are permitted by the local enforcement agencies with concurrence from the California Integrated Waste Management Board (CIWMB). Local agencies establish the maximum amount of solid waste which can be received by a landfill each day and the operational life of a landfill. Landfills are operated by both public and private entities (CIWMB, 2002a). Landfills in southern California are also subject to requirements of the SCAQMD as they pertain to gas collection systems, dust and nuisance impacts.

Chevron maintains a Source Reduction Evaluation Plan as required under the Hazardous Waste Source Reduction and Management Review Act of 1989 (SB14). The waste minimization strategies used at the Refinery include recycling, loss prevention, employee training programs, and waste segregation.

3.8 TRANSPORTATION AND TRAFFIC

The proposed project will occur at the Chevron Products Company El Segundo Refinery. Some improvements are also expected at nearby SCE and WBMWD facilities. The proposed modifications are entirely within the confines of the existing affected facilities. The existing transportation and traffic conditions adjacent to the Chevron Refinery are discussed below.

3.8.1 REGIONAL CIRCULATION

The Refinery is located at 324 West El Segundo Boulevard in the City of El Segundo. Regional transportation facilities in the vicinity of the project provide accessibility to the entire southern California region. The I-405 lies approximately one and one-quarter miles east of the Refinery and provides ramp connections at El Segundo Boulevard and Rosecrans Avenue. In addition, the I-105, and its related rail transit system are located approximately one mile north of the Refinery. Freeway interchanges to the regional arterial highway network provide access at regular intervals. El Segundo Boulevard, Sepulveda Boulevard and Rosecrans Avenue are key arterials servicing the area near the Refinery.

The I-405 is a north-south freeway facility located east of the El Segundo boundary. This freeway provides four travel lanes and one High-Occupancy Vehicle (HOV) lane in each direction between the LAX and the Harbor Freeway (I-110). The I-405 supports a heavy travel demand between residential areas and employment centers in the San Fernando Valley, West Los Angeles, Los Angeles Airport, and into Orange County. In addition to supporting the daily commute trips, heavy evening and weekend travel demand is caused by travel to and out of County destinations to the north and south. Surface street ramp access is available from El Segundo Boulevard, Rosecrans Avenue and La Cienega Boulevard. Daily traffic volumes on the San Diego Freeway along the segment bordering El Segundo, are approximately 280,000 vehicles per day (VPD) (City of El Segundo, 2004).

The I-105 is an east-west freeway located above and adjacent to Imperial Highway, at the northern boundary of the City of El Segundo. This 17-mile eight-lane facility, including an HOV lane traveling in each direction, connects LAX on the west, to the San Gabriel River Freeway (I-605) and the City of Norwalk on the east. A full interchange has been built for its intersection with the I-405. Access to the I-105 can be taken from the I-405 or directly to/from Nash Street, Douglas Street, Atwood Way or Imperial Highway in the City of El Segundo. Daily traffic volumes on the I-105 diminish towards its western terminus near Sepulveda Boulevard. Approximately 120,000 VPD travel this freeway between the I-405 and Douglas Street, with volumes dropping to less than 90,000 VPD at Sepulveda Boulevard, and finally to less than 25,000 VPD west of Sepulveda Boulevard (City of El Segundo, 2004).

3.8.2 LOCAL CIRCULATION

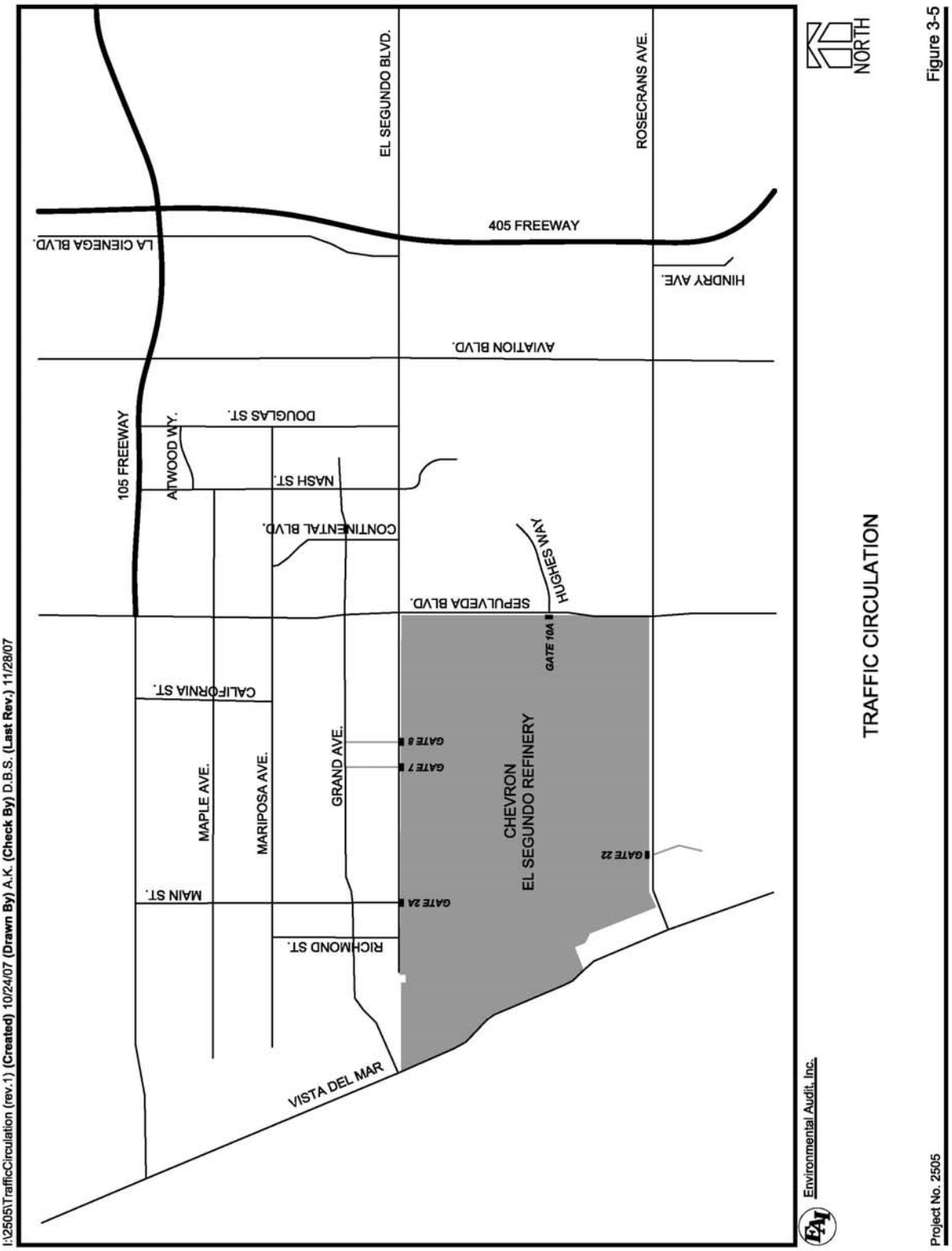
The Refinery occupies a rectangular shaped parcel of land and is bordered by El Segundo Boulevard to the north, Sepulveda Boulevard to the east, Rosecrans Avenue to the south and Vista Del Mar to the west (see Figure 3-5). Access to the Refinery is primarily from El Segundo Boulevard.

The City of El Segundo is served by an existing network of roadways. The existing street network is essentially a grid system of north/south and east/west roadways. The primary north/south roadways are: Aviation Boulevard; Douglas Street; Nash Street; Sepulveda Boulevard, Center Street; Main Street and Vista Del Mar. The primary east/west streets are: Imperial Highway; Maple Avenue, Mariposa Avenue; Grand Avenue; El Segundo Boulevard and Rosecrans Avenue. The City's roadway network is essentially established, with little or no opportunity to modify its basic configuration because of the developed pattern of land uses in the City (City of El Segundo, 2004).

El Segundo Boulevard, Sepulveda Boulevard, and Rosecrans Avenue are major highways with a function to connect traffic from collector streets to the major freeway systems as well as to provide access to adjacent land uses. Major highways move large volumes of automobiles, trucks and buses, and link principal elements within the City to other adjacent regions.

The area surrounding the Refinery is accessible via public transit from most South Bay Communities. The Los Angeles County Metropolitan Transportation Authority (MTA) provides several routes in the project vicinity. A number of MTA bus routes are routed throughout the city. Additionally, the Metro Green Line operates through the project area, linking the Refinery area with the continually expanding regional rail system. The Los Angeles Department of Transportation (LADOT), the City of Torrance Municipal Area Express (MAX), and the Torrance Transit also provide public transit services and commuter routes to and from the city (City of El Segundo, 2004a).

In addition to the vehicular system, the area surrounding the Refinery is serviced by a network of railroad facilities. This system provides an alternative mode of transportation for the distribution of goods and materials. The railroad network includes an extensive system of private railroads and several publicly-owned freight lines. The southern California Regional Rail Authority operates commuter rail systems in the Los Angeles area. Additionally, Amtrak provides inter-city service, principally between San Diego and San Luis Obispo. The Los Angeles area is served by two main-line freight railroads, the Burlington Northern Santa Fe and the Union Pacific Railroad. These freight railroads connect southern California with other U.S. regions, Mexico, and Canada via their connections with other railroads.


EL SEGUNDO BLVD.
ROSECRANS AVE.
405 FREEWAY
LA CIENEGA BLVD.
HINDRY AVE.
AVIATION BLVD.
105 FREEWAY
DOUGLAS ST.
ATWOOD WY.
NASH ST.
CONTINENTAL BLVD.
HUGHES WAY
SEPULVEDA BLVD.
GATE 10A
CALIFORNIA ST.
MAPLE AVE.
MARIPOSA AVE.
GRAND AVE.
GATE 8
GATE 7
CHEVRON
EL SEGUNDO REFINERY
GATE 22
MAIN ST.
GATE 2A
RICHMOND ST.
VISTA DEL MAR
NORTH
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Project No. 2505
Figure 3-5

3.8.3 EXISTING TRAFFIC CONDITIONS

The operating characteristics of an intersection are defined in terms of the level of service (LOS), which describes the quality of traffic flow based on variations in traffic volume and other variables such as the number of signal phases. Intersections rated at LOS A to C operate well. Level C normally is taken as the design level in urban areas outside a regional core. Level D typically is the level for which a metropolitan area street system is designed. Level E represents volumes at or near the capacity of the highway which will result in possible stoppages of momentary duration and fairly unstable traffic flow. Level F occurs when a facility is overloaded and is characterized by stop-and-go (forced flow) traffic with stoppages of long duration.

Peak hour LOS analyses were developed for intersections in the vicinity of the Refinery (see Table 3-12). The LOS analysis indicates typical urban traffic conditions in the area surrounding the Refinery, with all intersections, except one, currently operating at Levels A to D during morning peak hours (7 am – 9 am). One intersection currently operates at LOS E during morning peak hours, Sepulveda/El Segundo Boulevard. The evening peak hour conditions (4 pm – 6 pm) show overloaded conditions (LOS F) at two intersections, operating near capacity (LOS E) at one intersection, operating at LOS C at one intersection, operating at LOS D at one intersection, and the remainder of the intersections currently operating at LOS A to B.

3.8.4 REGULATORY BACKGROUND

The Circulation Element, an Element of the El Segundo General Plan, was adopted in 1992. The Circulation Element is a required Element under Government Code Section 65302(b) and addresses the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals and other local public utilities and facilities, all correlated with the Land Use Element of the General Plan. The Circulation Element contains a Master Plan of Streets, as well as a series of polices designed to guide the future evolution of the City's roadway system. The Master Plan of Streets includes all major arterial roadways in the City. As an Element of the General Plan, the Circulation Element is connected to other City planning policies and designations, such as those reflected in the Land Use Element with respect to the planned location, type and density of land uses in the City. The Circulation Element also includes policies that identify intersection improvements to achieve LOS D or better at intersections in the City that include re-striping of lanes and addition of left turn, through and right turn lanes. The lane requirements are set forth in the adopted Circulation Element based upon the designations of the roadways that comprise the legs of the intersections (e.g., major arterial, secondary arterial, collector, etc.) (City of El Segundo, 2004).

TABLE 3-12

Existing Traffic Conditions

Intersection	Existing AM Peak Hour		Existing PM Peak Hour	
	V/C Ratio	LOS	V/C Ratio	LOS
1. Sepulveda (SR1) and El Segundo Blvd.	0.982	E	1.104	F
2. Sepulveda (SR1) and Rosecrans Ave.	0.894	D	1.070	F
3. Sepulveda (SR1) and Imperial Hwy.	0.7563	C	0.718	C
4. Aviation Blvd. and El Segundo Blvd.	0.873	D	0.968	E
5. Aviation Blvd. and Rosecrans Ave.	0.815	D	0.807	D
6. La Cienega Blvd. and I-405 SB on/off	0.655	B	0.609	B
7. La Cienega Blvd. and El Segundo Blvd.	0.655	B	0.677	B
8. I-405 SB on and El Segundo Blvd.	0.875	D	0.634	B
9. I-405 NB on/off and El Segundo Blvd.	0.775	C	0.535	A
10. I-405 SB off and Rosecrans Ave.	0.638	B	0.628	B
11. I-405 NB on/off and Rosecrans Ave.	0.639	B	0.618	B
12. I-405 SB on/off and Hindry Ave.	0.320	A	0.541	A
13. California St. and Imperial Hwy.	0.451	A	0.486	A
14. Main St. and Imperial Hwy.	0.672	B	0.639	B
15. Continental and Grand Ave.	0.319	A	0.277	A
16. Continental and Mariposa Ave.	0.411	A	0.415	A
17. Nash St. and Mariposa Ave.	0.332	A	0.344	A
18. Douglas St. and Mariposa Ave.	0.283	A	0.482	A
19. Douglas St. and Atwood Way	0.157	A	0.301	A

V/C ratios and associated LOS definitions are defined below)

V/C Ratio .00 - .60 = LOS A Free flow (very slight or no delay)
V/C Ratio .61 - .70 = LOS B Stable flow (slight delay)
V/C Ratio .71 - .80 = LOS C Stable flow (acceptable delay)
V/C Ratio .81 - .90 = LOS D Approaching unstable flow or operation (tolerable delay)
V/C Ratio .91 – 1.0 = LOS E Unstable flow (at maximum capacity; unacceptable delay)
V/C Ratio 1.0 or more = LOS F Forced flow (above maximum capacity; unacceptable delay)

The Draft EIR for the proposed Circulation Element Update is also subject to the Land Use Analysis program of the Congestion Management Program for Los Angeles County (CMP). The legislation establishing the requirement for counties to adopt a CMP was adopted in 1992 by the State of California and was last amended in 1997. The CMP is a state-mandated program designed to address urban congestion. The CMP is adopted by the designated Congestion Management Agency (MTA). The most recent version of the CMP was adopted by MTA in 2004 (MTA, 2004). The CMP analysis assesses potential impacts on the freeway network and key intersections in the system of surface streets. The CMP includes a system of highways and roadways with minimum LOS standards, transit standards, a trip reduction and travel demand management element, a program to analyze the impacts of local land use decisions on the regional transportation system, a capital improvement program, and a countywide computer model to evaluate traffic congestion

and recommend relief strategies and actions. Proposed projects that have the potential to significantly impact the designated CMP network (mainline freeway segments and principal arterial streets and highways) are required to identify and to mitigate, where feasible and appropriate, their adverse effects on the network. If the LOS standards on CMP-monitored roadways are not maintained, local jurisdictions must prepare a "deficiency plan" which is in conformance with the Countywide CMP plan (City of El Segundo, 2004).

There is one CMP-designated arterial highway within the City of El Segundo: Sepulveda Boulevard. CMP intersections are defined as key intersections spread roughly two miles apart. The Sepulveda Boulevard/El Segundo Boulevard intersection is the only CMP-designated intersection in El Segundo (MTA, 2004).

Freeways are controlled access, high-speed roadways with grade-separated interchanges intended to expedite movement between distant areas in the region. Planning, design, construction and maintenance of freeways in California are the responsibility of the California Department of Transportation (CalTrans).

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